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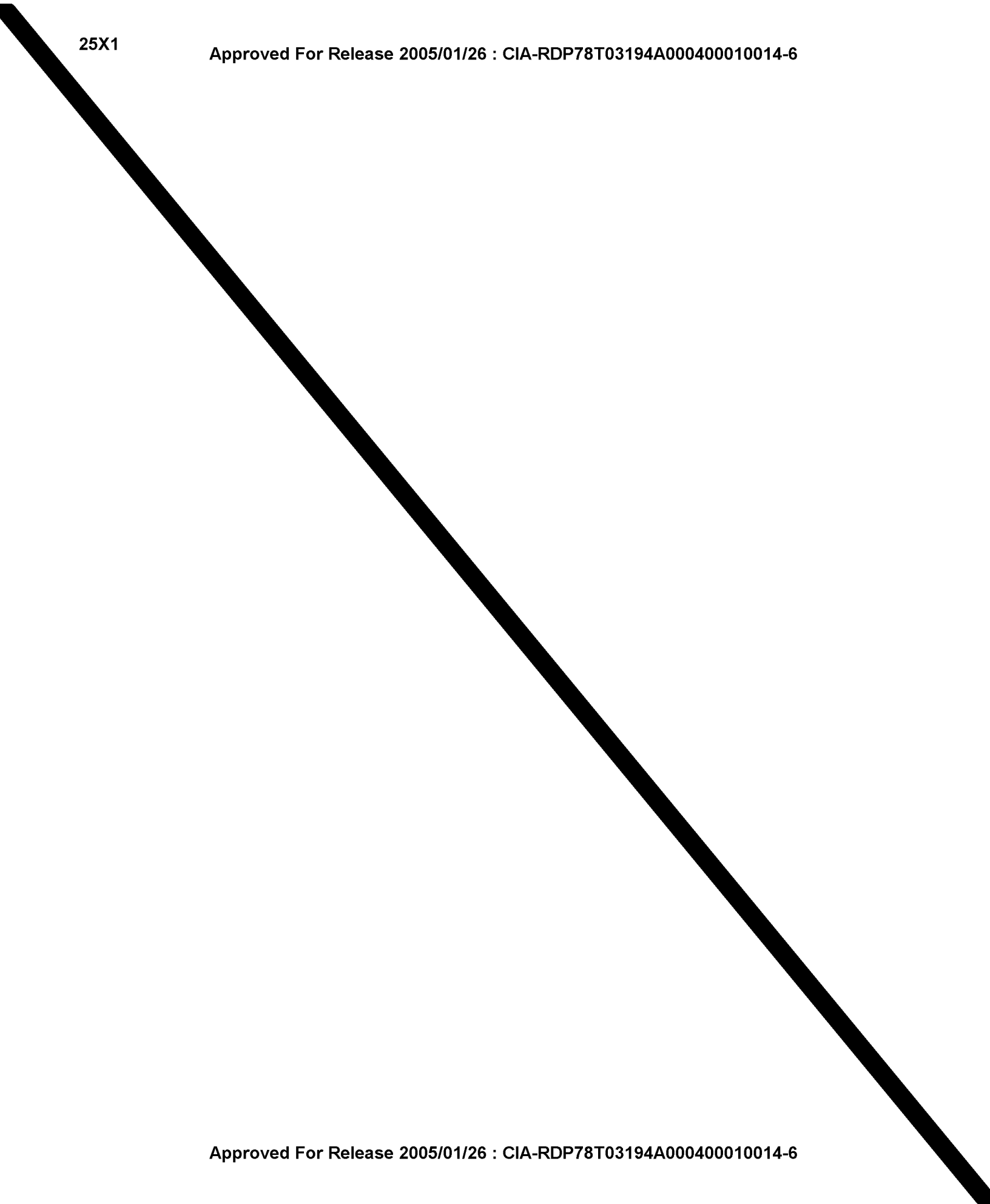

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*A 1964 view of KGB methods*

# SOVIET USE OF ASSASSINATION AND KIDNAPING*

It has long been known that the Soviet state security service (currently the KGB) resorts to abduction and murder to combat what are considered to be actual or potential threats to the Soviet regime. These techniques, frequently designated as "executive action"** and known within the KGB as "liquid affairs" (*Mokryye Dela*), can be and are employed abroad as well as within the borders of the USSR. They have been used against Soviet citizens, Soviet emigrés, and even foreign nationals. A list of those who have fallen victim to such action over the years would be a very long one and would include even the co-founder of the Soviet state, Leon Trotsky. Several well-known Soviet assassination operations which have occurred since the rise of Khrushchev attest to the fact that the present leadership of the USSR still employs this method of dealing with its enemies.

The sudden disappearance or unexpected death of a person known to possess anti-Soviet convictions immediately raises the suspicion of Soviet involvement. Because it is often impossible to prove who is responsible for such incidents, Soviet intelligence is frequently blamed and is undoubtedly credited with successes it actually has not achieved. On the other hand, even in cases where the Soviet hand is obvious, investigation often produces only fragmentary information, due to the KGB ability to camouflage its trail. In addition, Soviet intelligence is doubtless involved in incidents that never become officially recognized as executive action, such as assassinations which are recorded as accidents, suicides, or natural deaths.

All of the factors cited above have helped to obscure Soviet practices in regard to assassinations and abductions outside the USSR. Certain observations can be made, however, which will help to put these practices into their proper perspective. These observations are set forth in the following paragraphs and are based on information produced by the investigation of known or suspected Soviet operations which have occurred since World War II, as well as from information supplied by defectors during this period.

*Targets*

The large numbers of former citizens of the USSR (and of Imperial Russia) living abroad in protest against the Soviet regime have been a continuing cause for concern to the Soviets since the early twenties. Reducing and keeping to a minimum the potential threat to the regime represented by these emigrés is one of the functions of the state security service. Soviet intelligence seeks to neutralize, discredit and destroy anti-Soviet groups by luring emigrés back to the USSR, by penetrating emigré organizations, and by kidnaping or murdering individual emigrés considered to be particularly dangerous.

Emigré leaders who participate in anti-Soviet activities have been primary targets of Soviet abduction or assassination operations. Such operations are sometimes

*This is a CIA Memorandum prepared in February 1964 for the President's Commission on the Assassination of President Kennedy (The Warren Commission) and declassified in 1971. It should be pointed out that the memorandum sets forth KGB policy and techniques as of 1964.

**Strictly speaking, the term "executive action" emcompasses diversionary activities (such as sabotage) as well as terroristic activities. This paper, however, discusses only the terroristic aspect of Soviet executive action, namely, kidnaping and assassination.

designed to demonstrate that the Soviet regime can strike its enemies anywhere in the world. The Soviets hope thereby to create fear, unrest, confusion, and dissension within emigré organizations, and at the same time deter other emigrés from joining their ranks. The planned assassination in February 1954 of Georgiy S. Okolovich, leader of the NTS emigré organization, was to have been a particularly significant step toward achieving this goal, but the act was not carried out because of the defection of state security Captain Nikolay Khokhlov.

On the other hand, assassinations of some emigré leaders have been carried out so skillfully as to leave the impression that the victims died from natural causes. Details of some of the techniques used to achieve this were brought to light in 1961 when professional KGB assassin Bogdan Stashinskiy defected to the West and revealed that he had successfully performed two such missions. In 1957 he killed Ukrainian emigré writer Lev Rebet in Munich with a poison vapor gun which left the victim dead of an apparent heart attack. In 1959, the same type of weapon was used on Ukrainian emigré leader Stepan Bandera, although Bandera's death was never fully accepted as having been from natural causes. These cases are discussed in more detail later in this paper.

Executive action is also triggered by any signs of possible disloyalty on the part of Soviet officials abroad. The Soviets have gone to great lengths in the past to silence their intelligence officers who have defected, as evidenced by the assassination of former state security officer Ignace Reiss in 1937 and the unexplained "suicide" of former Soviet military intelligence officer Walter Krivitsky in 1941. In the post-war era, determination to prevent such defections was vividly demonstrated by the unsuccessful attempt to force the wife of Vladimir Petrov to return to the Soviet Union from Australia after his defection in April 1954. The practice of physical restraint applies with equal force to other Soviet officials who attempt to defect or are suspected of being on the verge of doing so. Examples were witnessed in Calcutta, India in January 1958 and Rangoon, Burma in May 1959. The respective victims, Aleksandr F. Zelenovskiy and Mikhail I. Strygin, were both portrayed by the Soviets as mental cases, were taken into custody by means of strong-arm tactics, and were forcibly removed to the USSR in a matter of days.

Foreign nationals are sometimes victims of Soviet executive action. The targets who fall into this category may be indigenous agents who have become suspect, or former citizens of satellite countries who have turned against the Soviet regime. In the latter case, actions against such individuals are usually carried out through the corresponding satellite intelligence service, aided and abetted by Soviet state security. The abductions of Dr. Walter Linse and Bohumil Lausman exemplify this type of operation. Linse had fled East Germany in 1947 and later became a leader of the "Society of Free Jurists," an anti-Communist organization that the Soviets considered particularly dangerous. He was kidnaped from West Berlin in July 1952 by agents of the East German security service, with the full knowledge and approval of Soviet state security; he was later turned over to Soviet authorities in Karlshorst, East Berlin, and eventually sentenced to imprisonment in the USSR.* Lausman, prominent Czech anti-Communist who fled to the West in 1949, disappeared from Vienna in 1953. It was later learned that he had been kidnaped by agents of Czech intelligence, with the

*Linse died in a Soviet prison camp 15 December 1953, according to a statement issued by the Soviet Red Cross on 8 June 1960, a virtual admission of Soviet responsibility for the kidnaping. The cited date of his death is at variance, however, with information from fellow prisoners of Linse who reported having seen him in 1954 and 1955.

official sanction of Moscow. The Soviet state security *rezidentura* in Vienna also had been directed to assist the operation by supplying a car for transportating Lausman to Prague and arranging for the vehicle to have free passage through the Soviet Zone of Austria.

Foreign political leaders are also potential targets of Soviet executive action operations and, according to recent information, the KGB's executive action component includes such persons among its targets. There is, however, no evidence proving that any Western leader has been the victim of Soviet executive action.

*Organization*

The executive action component of the Soviet government is currently designated the 13th Department of the KGB intelligence directorate (First Chief Directorate). The earliest known predecessor of the 13th Department was the so-called "Directorate of Special Tasks" reportedly established within the NKVD in December 1936 for terror purposes. During World War II terror missions were performed by the NKGB Fourth Directorate, which was responsible for partisan activity behind German lines. In late 1945 or early 1946 this directorate was replaced by a unit of the MGB known as *Spets Byuro #1*, which was organized to retain Fourth Directorate personnel to support and direct partisan activities behind enemy lines in the event of a future war. In the summer of 1952, however, the long-range aspects of *Spets Byuro #1* mission were abandoned, and emphasis was shifted to using all available agents for sabotage and other violent activities. *Spets Byuro #1* was given a new, and at present still unknown, designation some time in 1953 and assigned to carry out "special action tasks," such as sabotage, political murders, and kidnapings. With the creation of the KGB in 1954, the executive action component was redesignated as the 13th Department. Although the jurisdiction of the department is global, its main target areas are the United States and members of Western treaty organizations. There is no evidence of the existence of any unit within the Soviet military intelligence component (the GRU) responsible for the type of executive action discussed in this paper, although the GRU reportedly can undertake such operations under certain circumstances.

The 13th Department is believed to be divided into sections (*otdeleniye*) or directions (*napravleniye*) by countries or groups of countries, such as, for example, the United States ("the principal enemy"), England, Latin America, etc. At Moscow headquarters the department has approximately 50 to 60 experienced employees, and was last known to be headed by a General Rodin, who under the alias Korovin had previously been the KGB resident in Great Britian. Secrecy about the work of this department is maintained through the careful selection and training of its personnel; the officers do not discuss their experience among others; department documents are not circulated.

In addition to headquarters personnel, the 13th Department has its own support officers in legal residencies in Western countries and in some satellite countries. Such support officers work under the instructions of the legal resident and the 13th Department. One of the more active groups is a unit in East Germany which numbers perhaps 20 to 30 persons. As of 1960 there was a group in China, but it probably no longer exists. Prior to 1955 there was also a group in Austria. In a country in which a support officer of the 13th Department is stationed, the legal resident and the headquarters department for that country are aware of the targets of the 13th Department in that country, although they are not aware of illegal agents who are in direct contact with the 13th Department.

Although the 13th Department is the KGB's executive action component, the Emigré (Ninth) Department directs all operations, including assassination operations, against Soviet emigrés. The Emigré Department's assassination operations, however, are believed to be conducted jointly with the 13th Department and sometimes other KGB components—for example, the counterintelligence directorate (Second Chief Directorate).

The 13th Department also supports the Disinformation (12th) Department of the First Chief Directorate in the latter's covert propaganda campaigns aimed at the creation of confusion and panic in Western countries. An example is the campaign conducted, in 1959 and later, for the purpose of creating adverse world opinion toward West Germany. This campaign included setting fire to synagogues and painting swastika signs in public places, and attributing these acts to West Germans. Other operations in which both the 13th Department and the Disinformation Department are involved include attempts to remove the threat to Soviet interests posed by certain members of Western governments. Sometimes this entails arranging for the dismissal of such persons from public office, but in theory at least it could mean "eliminating" them physically.

*Installations*

The defector Khokhlov described two laboratories associated with the executive action department. One produced special weapons and explosive devices; the other developed poisons and drugs for "special tasks." The explosives laboratory was located near Kuchino, outside Moscow, and was responsible for the development and production of weapons, from drawing up blueprints to melting and pouring bullets. In no case was assistance obtained from military ordnance or other outside agencies.

The laboratory for poisons was supposedly a large and super-secret installation. No agents were permitted access to it or even knew of its location. Khokhlov could provide no first-hand information on it. Other sources, however, have reported the existence of this type of laboratory dating back to the purges in the late 1930's. A report from one source in 1954 described an experimental laboratory within *Spets Byuro #1* known as the "Chamber" (*Kamera*). This laboratory conducted experiments on prisoners and persons subject to execution to test the effectiveness of different powders, beverages, and liquors, and various types of injections, as well as research on the use of hypnotism to force prisoners to confess. Beside its staff, only certain high-level persons were permitted to enter its premises. Although its existence officially was kept a secret, it was generally suspected or known by many state security functionaries that a unit of this sort was maintained. The Soviet government allegedly abolished the "*Kamera*" in October 1953, according to an announcement made to selected state security and Party officials, attributing the establishment and operation of the laboratory solely to Beriya and his close associates. Whether or not this step actually was taken does not rule out the possibility, however, that the same type of unit continues to exist in some other form.

Training for executive action operations was conducted at a base in Moscow by a staff of instructors who specialized in such subjects as the use of small arms, jujitsu, code, wireless, driving, surveillance, and photography.

Although executive action operations outside the USSR are planned, directed, and sometimes carried out by state security staff personnel, a mission may also be performed by one or more agents recruited specifically for this prupose. Khokhlov himself, for instance, was categorically forbidden to assassinate Okolovich personally.

Two German agents, Hans Kukowitsch and Kurt Weber, were to carry out the deed under Khokhlov's supervision. This reflected Soviet theory that indigenous personnel would have better access to the target, and also had the advantage of avoiding direct Soviet attribution. It appears from the Stashinskiy case, however, that security considerations ruled out the involvement of non-Soviets in more recent operations.

Even though some sources have made statements to the contrary, it appears that the agents (as opposed to staff employees like Stashinskiy) who perform executive action for the Soviets may be used for more than one mission of this nature. Khokhlov spoke of special executive action units known as "*boyevaya gruppa*" (literally, combat groups) which consisted of indigenous agents and/or Soviet illegal staff officers situated outside the borders of the USSR on the territory of hostile governments or in close proximity thereto. Such groups were armed and prepared to perform executive actions when required to do so, either in time of peace or war. A group of this type under the direction of the executive action department base at Karlshorst ostensibly was involved in the kidnaping of Dr. Alexander Trushnovich, an NTS leader in West Berlin, in April 1954, Khokhlov believed the abductors to have been recruited and organized by the East German security service at the request of the KGB chief at Karlshorst. The same type of group was mentioned in connection with the abduction of Dr. Linse; the actual abduction was reportedly performed by four German members of a "*boyevaya gruppa*" from East Germany. It is probable that such teams are a modern variation of the "mobile groups" described by a pre-war source as units dispatched from Moscow to foreign countries to assassinate Trotskyites and state security officers who refused to return to the USSR, as in the case of Reiss and possibly Krivitsky.

*Techniques*

Many known or suspected executive action cases in the post-war period have involved the use of poison rather than guns or explosives. It is conceivable that the Soviets tend to favor poisons because murders can be accomplished more surreptitiously in this manner and in some instances without leaving easily recognizable traces of foul play. Drugs are also used to incapacitate a person temporarily for abduction purposes, as reportedly happened in the Trushnovich case and in the kidnaping of another NTS member, Valeri P. Tremmel, from Linz, Austria in June 1954. There are, however, many unknown, uncontrollable factors in the use of poisons and drugs which limit and often preclude their usage. Probably the most important is the narrow span between a dose that will cause disability and one that will cause death. Dosages vary from one individual to another depending on weight, state of health, and how the poison enters the body. The type used obviously is determined by the result desired. It is no problem to cause death, but often difficult to control dosage successfully when the objective is to incapacitate an individual only temporarily.

There appears to be no consistency in the use of poisons by Soviet intelligence to cause disability or death, or in the repetitious use of any one drug. Chemicals which have been used in cases known or suspected to be Soviet-instigated include arsenic, potassium cyanide, scopolamine, and thallium. Other likely substances are atropine, barbiturates, chloral hydrate, paraldehyde and Warfarin. Combinations of two or more substances may also be used, which further complicates diagnosis and tracing.

One well-publicized poisoning case involved the defector Nikolay Khokhlov. Khokhlov suffered a sudden and severe illness while attending an anti-Communist

meeting in Frankfurt, Germany in September 1957. A positive diagnosis was precluded by the initial treatment given him at a German hospital, but there was evidence of his having been poisoned by a thallium derivative of arsenic and/or other chemical agents, and a strong possibility that the poison had been administered at RIS instigation. Khokhlov himself believed, and allegedly had supporting medical opinion, that he had been poisoned by radio-activated thallium. He believed that the poison was of Russian origin because it was such a complicated substance that it was difficult to analyze and had been carefully prepared to leave virtually no trace. A unique mechanism for administering poison was described by a knowledgeable source as a pneumatically operated poison ice "atomizer" which leaves no wound or other evidence of the cause of death. The equipment and techniques used in the poisoning of Rebet and Bandera are treated below in some detail as examples of the most recent and sophisticated methods in use by the KGB.

*Specific Cases*

1. *Stashinskiy:*

In November 1961 a Soviet intelligence officer, Bogdan Stashinskiy, surrendered to the West German police, stating that he had, acting under official orders, assassinated two individuals during the previous few years: Lev Rebet, a Ukrainian emigré writer, and Stepan Bandera, a leader of the Ukrainian Nationalist movement. In both cases, a similar type of weapon had been used: a gun which fired vaporized poison which killed almost instantly upon being inhaled. The properties of the killing agent were such that, until the defection of the assassin, both victims were officially believed to have died from heart attacks. In the case of Bandera, however, there was some unconfirmed suspicion of potassium cyanide poisioning, although there was insufficient evidence to prove it.

*The Weapon:* The weapon used to assassinate Rebet was a light-weight aluminum cylinder, 15 to 18 cm. long and approximately 3 cm. in diameter, weighing about 200 grams. The cylinder was divided into three separate chambers, one of which contained liquid poison sealed hermetically into a plastic-type ampule container under low pressure. (At normal temperatures the poison would evaporate, disappearing without trace in about two minutes.) The three components could be assembled by means of a thread which allowed one part to screw into the other. The first component was the posion ampule portion, the front end of which had a fine metallic screen. The poison ampule fitted solidly against the walls of the metal cylinder. The center component contained a piston and a piston arm which extended into the third or activating component. The latter contained a spring-mounted activating arm which, when drawn back, armed the weapon. The releasing arm was appended to the third component at an angle, and was attached to the activating arm by means of a releasing catch. A small safety arm permitted the weapon to be placed in the safety position. The third component also contained a few grams of powder.

The maximum effective range of the weapon was about one-half meter; at one and one-half meters the effect of the vapors would be questionable; and at two and one-half meters, the vapors would be totally ineffective. (The assassin was instructed to fire the weapon only inches from the face.)

The weapon was activated as follows: The activating arm was pulled back and the safety released. The weapon was then activated. It was held in the palm of the hand in such a fashion that it fired when the user pressed the releasing arm towards the activating arm. The releasing arm, when pressed, acted upon the releasing catch,

permitting the spring-held activating arm to fly forward against the small charge of powder. The exploding powder (which made a noise approximating the sound of a loud handclap with the hands cupped) drove the piston arm forward, causing the piston to strike against the poison ampule. The poison was thus driven out through the fine screen in the form of a liquid spray.

The weapon used for the second assassination was similar, except that it was double-barreled. Each barrel contained a charge of poison similar to that contained in the single-barreled weapon. The two barrels could be discharged separately, or together as a unit. Thus, in the event the first charge did not kill the victim, a second attempt could be made. The two barrels were welded together, and the weapon had two releasing arms, two releasing catches, two safeties, and two activating arms. The effect of the poison was the same.

*Utilization of the Weapon:* For maximum effective results it is recommended that the liquid poison be shot directly into the face of the victim, in order to introduce the vapors most quickly into the respiratory system. Since the vapors rise upward very rapidly, the poison is still effective when aimed at the chest; conceivably, this would give sufficient time to allow the victim time to scream.

*Effects of the Poison:* The effect of the poisonous vapors is such that the arteries which feed blood to the brain become paralyzed almost immediately. Absence of blood in the brain precipitates a normal paralysis of the brain or a heart attack, as a result of which the victim dies. The victim is clinically dead within one and one-half minutes after inhaling these poisonous vapors. After about five minutes the effect of the poison wears off entirely, permitting the arteries to return to their normal condition, leaving no trace of the killing agent which precipitated the paralysis or the heart attack.

Allegedly, no foreign matter can be discovered in the body or on the clothes of the victim, no matter how thorough an autopsy or examination. The liquid spray can be seen as it leaves the nose of the weapon, however, and droplets can also be seen on the face of the victim.

Stashinskiy claimed that before using the weapon on his first victim, he tested it on a dog. He fired the gun directly into the dog's face, holding his hand approximately one and one-half feet from its nose. Almost immediately after the liquid spray had hit its face, the dog rolled over, without making any sound whatever. It continued to writhe for almost three minutes, however. Stashinskiy was told that the poison affected a human much sooner, causing death within one and one-half minutes.

*Safety Precautions for the User:* Stashinskiy was told that neither the poisonous liquid nor the fatal fumes affected any portion of the body other than the respiratory system, and that, since it could not enter the body through the skin or the pores, one could safely place his hands into a pail of the poison. Inasmuch as the weapon was held at arm's length when fired and the liquid spray ejected forward in a conical pattern, the user, under normal conditions, is safe from the effects of the poisonous vapors. Nevertheless, as an extra precaution, Stashinskiy was provided with counteractive agents to use if he so desired.

*Concealment Methods:* For transportation, the weapon was transported hermetically sealed in a container, and inserted between sausages in a can which was itself hermetically sealed. It was suggested to Stashinskiy that he should carry the weapon to the site of the plannned assassination wrapped in a light newspaper, in

which he had torn a small hole to enable him to reach the safety quickly just before using the weapon.

*Method of Attack:* In the first assignment, Stashinskiy observed Rebet debarking from a streetcar at about 0930 hours. Observing that the victim was heading for his office, the assassin preceded him into the building and climbed the circular staircase to the first floor. On hearing Rebet's footsteps on the staircase, Stashinskiy turned and started walking down, keeping to the left, and carrying the weapon, wrapped in newspaper, in his right hand. The two met about halfway between the two floors. Firing directly into Rebet's face from a distance of approximately one-half meter, Stashinskiy continued walking downstairs without even breaking his pace. The victim lurched silently forward and fell on the staircase. While still in the building, Stashinskiy shook off the liquid drops from the weapon and put it in the breast pocket of his suit. (A laboratory examination of the suit later revealed nothing of significance.) Although he had no reason to believe that he had inhaled the poisonous fumes, he used the counteractive measures provided. He later disposed of the murder weapon in a shallow canal in the city.

In carrying out his second mission, Stashinskiy used a similar approach. Having previously abandoned an attempt to corner Bandera in the latter's garage, the assassin gained entry to the victim's apartment house by reproducing a key which he had observed being used in the front door lock. On the day of the assassination, having seen Bandera drive into his driveway, Stashinskiy let himself into the apartment building and waited. Bandera, carrying several packages of fruit and vegetables in his right hand, entered the front door with the aid of a key which was on a key ring together with other keys. As he was attempting to disengage the key from the lock, Stashinskiy moved away from the elevator, where he had been standing, toward the front door. The weapon was in his hand with the safety released. As he walked past the victim, who was still trying to extricate the key from the lock, the assassin took the door handle with his left hand, as if to assist Bandera, asking him "Doesn't it work?" By this time, Bandera had succeeded in pulling the key out of the lock. Almost at the instant he replied "Yes, it works," Stashinskiy fired both barrels simultaneously into his face at almost point-blank range. Seeing the victim lurch backward and to the side, the assassin walked out of the apartment building and closed the front door. Although he did not wait to see Bandera drop to the ground, Stashinskiy is certain that, contrary to press reports, the man did not scream or otherwise call for help. Stashinskiy later threw the murder weapon into the same canal in which he had discarded the first weapon.

Although the press reported that Bandera had been attacked physically before he was poisoned, Stashinskiy insisted that he had used no force, since it had not been necessary to do so. Some newspapers also reported that Bandera had died of potassium cyanide poisoning. Stashinskiy claimed that he was told, and believes, that the chemical was not potassium cyanide, since (1) he thinks that substance could not have been introduced into the body by the method employed, and (2) he believes the RIS would have no reason to deceive him on this matter, especially since he had to be provided with counteractive precautions. Stashinskiy claimed that one of his Soviet contacts was pleased to learn that the police suspected potassium cyanide, as this allegedly indicated that the true cause of the victim's death was not evident.

II. *Radio Free Europe:*

*The New York Times* reported on an attempt to poison the staff of RFE on November 21, 1959, by placing atropine in the salt shakers of the cafeteria used by

RFE personnel. Atropine is a derivative of the deadly nightshade plant; it can cause paralysis of death if taken in sufficient quantity. The amount of poison in each salt shaker was said to be 2.36% by weight of the contents. White crystalline alkaloid is indistinguishable from salt. (Unclassified, from *NYT*, 17 December 1959.)

III. *Stein:*

In March 1955, Lisa Stein, an interviewer with RIAS, the American propaganda radio station in West Germany ("Radio in American Sector"), was fed candy containing the highly dangerous poison scopolamine. (Scopolamine is used in the so-called "twilight sleep." Given in small doses it induces a kind of euphoria; in larger doses it is supposed to be a deadly poison.) It was intended that Frau Stein would become ill and would be abducted. The plan was that the agent—someone whom Frau Stein trusted and with whom she was meeting in a West Berlin café—would offer the poisoned candy toward the end of the meeting. The lady was expected to become ill while walking from the café to her nearby residence. On becoming unconscious, she was to be picked up by a waiting car which would appear to be passing by chance. The plot was not carried to fruition, however, because Frau Stein did not become ill until she was near her apartment, at which point neighbors came to her aid and she was moved to a hospital. She was severely ill for 48 hours, after which an antidote was found. (Unclassified, from the testimony of Theodor Hans, formerly with U.S. Military Intelligence, Germany, September 21, 1960, before a Congressional investigating committee.)

IV. *Other:*

Another weapon used is described as a noiseless gas pistol, powered by a 300-volt battery, which fires a lethal, odorless, unidentified gas. The gas acts in two or three seconds, and is effective up to 15 or 20 meters. The pistol has three buttons: one for arming, one for firing, and the third for recharging the battery. (After 50 firings the battery may be recharged by plugging a transformer into normal house power source.) The piston is normally fired 20 times, very rapidly and automatically—"Bzzzd." (Although one squirt could kill, 20 squirts are emitted in order to saturate the area, inasmuch as the gun is fired at a silhouette, rather than at a point.) The gas shot by the pistol would penetrate the victim's clothing and enter the skin. There is allegedly no danger to the user.

*Trends*

Since World War II, and especially in the years since Stalin's death, assassination attempts abroad have become increasingly rare. Currently the emphasis in the executive action field is placed on sabotage and sabotage planning, rather than terrorism against individuals. The Soviets now apparently resort to murder only in the case of persons considered especially dangerous to the regime and who, for one reason or another, cannot be kidnaped. A kidnaped person is obviously more valuable inasmuch as the Soviets may be able to extract from him information of interest, as well as use him for propaganda purposes by making it appear that he defected to the Soviet side of his own fee will. This course was followed in the case of Dr. Trushnovich. It is also likely that the Soviets find it increasingly difficult to find persons willing to undertake murder assignments, while the same may not be true of abduction operations. It can further be conjectured that the Soviets are now more concerned about the adverse publicity generated by Soviet assassinations in general than they were in previous years.

In this connection, comments made by state security defectors Petr Deryabin and Yury Rastvorov in 1954 about what the Soviets would or would not do are still of interest. Both believed that the Soviets would murder one of their officials on the verge of defecting if that were the only way of preventing the act. The same would apply to a Soviet official who had just defected, if thereby state secrets could be preserved, and if they believed that killing him would not bring about a more adverse situation in terms of politics and propaganda than already existed. Deryabin and Rastvorov doubted, however, that the Soviets would murder an official who had been in non-Communist hands long enough to have been exploited for intelligence and propaganda purposes. While both granted that in particular cases the Soviets might go to any extreme, they both believed, generally speaking, that the adverse propaganda resulting from such an act would negate its original purpose. On the other hand, Khokhlov, who might have been in a better position to know, has stated without qualification that the Soviets would continue to assassinate defectors in the future. The threat of Soviet executive action against defectors is also considered a real one by Reino Hayhanen, who defected from the KGB in 1957. A still more recent Soviet intelligence source also believes that standard Soviet practice is to mount a kidnaping or assassination operation "through all intelligence opportunities" against defectors from the Soviet intelligence services.

Deryabin and Rastvorov further agreed that the Soviets, without hesitation, would forcibly return to the USSR someone on the verge of defecting at a mission abroad. This was borne out by the aforementioned Strygin and Zelenovskiy cases. Deryabin and Rastvorov also believed that the same policy would apply to a Soviet official who had just defected, or one who had been in non-Communist hands long enough to have been exploited for intelligence and propaganda purposes, if the capability existed for returning him physically to the USSR.

Lastly, Deryabin believed that the assassination of an Allied official would be highly unlikely and probably unprofitable. He also doubted that the Soviets would attempt to kidnap any U.S. officials unless they were particularly knowledgeable. Such an incident would not be worth the trouble for an average official, but an important person conceivably would have sufficient information to make it worthwhile.

*A case study of the Muruntau Gold Plant*

# ESTIMATING SOVIET GOLD PRODUCTION

**Richard Flynn**

The USSR has long maintained a veil of strict, unbroken secrecy on domestic production of gold. The State Secrets Decree of 1947, amended in 1958, forbids disclosure of data on the quantity of gold produced, plan goals, production capacity of plants, and the size of gold deposits. To help ensure a reticent attitude among knowledgeable Soviet officials, the State Secrets Decree carries harsh criminal sanctions for violation of its provisions.

Since the early 1950s, intelligence analysts in the Office of Economic Research (OER) and its predecessor, the Office of Research and Reports, have tried to unravel the mystery of Soviet gold production. By effective use of all-source intelligence—and with expert assistance of other components of the intelligence community, non-USIB agencies, and sources in the business community—OER was able to penetrate much of the official blackout on gold production in the USSR and to develop estimates that are accepted as the official position of the United States government and by the intelligence services of allied nations as well.

Intelligence methods used to estimate gold production in the USSR are highlighted by a new methodology developed to estimate the capacity of the Muruntau Gold Plant, the largest gold plant in the world.*

## *The Basic Methodology*

Gold is produced in the USSR by two methods: by mining placer and vein deposits, and by recovery as a by-product in the processing of other non-ferrous metals such as copper, leads, and zinc.

The Northeast Region, which consists of Magadanskaya Oblast and the Yakutskaya ASSR, is the country's largest gold-producing region. Open source Soviet literature revealed that the Northeast Region accounted for 60 to 65 percent of Soviet production of mined gold in the late 1950s. The rest was produced mainly in the Lena area of Irkutsk Oblast, the Transbaikal Region, the Kazakh SSR, and scattered locations in the Ural Mountains. Annual plan fulfillment data indicated that production of mined gold in other parts of the USSR was increasing about as rapidly as it was in the Northeast Region. Hence, the geographic distribution of mined gold production in the USSR was not changing much from year to year. Total Soviet production of mined gold thus could reasonably be estimated because two critical parts of the puzzle were known: a) the amount of gold produced in the Northeast Region, and b) this region's share of total Soviet production of mined gold.

Production of gold derived from by-product recovery was estimated using a weighted average recovery factor of 35 grams of gold (slightly more than 1 troy ounce) per ton of refined copper in conjunction with previously developed estimates of Soviet

*Many CIA personnel made valuable contributions to the original OER report on which this article is based, in particular John Keilty (OER); Mrs. Louise Noyes, John Jackson, and Richard Ordemann (IAS); Will Rogers (OGCR); and George Gilbert (DCD).

copper production. This average recovery factor was developed using information on average gold recovery at each copper refinery in the USSR. With these established tools, OER analysts developed estimates of annual Soviet gold production covering the period from 1957 through 1968. (See Table 1.)

Gradually, our confidence in the methodology increased, but we were aware of the fact that it hinged precariously on one key relationship: that gold production in the Northeast Region would remain a relatively constant share of total Soviet production of mined gold. In the late 1960s, evidence began to mount that this relationship of the Northeast to total production was about to change. The Soviets were building a huge gold processing plant outside the Northeast Region at Muruntau in the Uzbek SSR. The sheer size of the project suggested that the plant would produce large amounts of gold. New tools had to be developed to estimate the capacity of the Muruntau gold plant.

*Muruntau*

Muruntau—"Nose Mountain" for those not fluent in Uzbek—came to the attention of the intelligence community in 1964. In that year, the Soviet press began reporting that huge deposits of gold had been discovered at Muruntau in the Kyzyl-Kum desert of central Uzbekistan. The Soviet press first announced that Muruntau was the largest deposit of gold in the USSR. Later reports claimed that Muruntau was the largest gold deposit in the world.

Overhead photography of the Muruntau area in 1965 revealed evidence of large-scale geological prospecting, the possible beginning of an open pit mine, and a

**Table 1**

**Gold Production in the USSR, 1957-68**
**(in Metric Tons)**

| | Mined Gold | | | |
|---|---|---|---|---|
| | Northeast Region | Other Areas | By-Product* | total |
| 1957 | 48 | 32 | 14 | 94 |
| 1958 | 51 | 34 | 14 | 99 |
| 1959 | 55 | 35 | 15 | 105 |
| 1960 | 58 | 36 | 17 | 111 |
| 1961 | 62 | 38 | 18 | 118 |
| 1962 | 68 | 38 | 19 | 125 |
| 1963 | 71 | 42 | 21 | 134 |
| 1964 | 77 | 43 | 23 | 143 |
| 1965 | 86 | 44 | 24 | 154 |
| 1966 | 92 | 46 | 26 | 164 |
| 1967 | 96 | 48 | 28 | 172 |
| 1968 | 99 | 51 | 32 | 182 |

*By-product gold is obtained at the copper refineries located at Kyshtym, Norilsk, Pyshma (RSFSR); Balkhash, Dzhezkazgan, Irtysh (Kazakh SSR); Alaverdi (Armenian SSR); and Almalyk (Uzbek SSR).

considerable amount of unidentified construction. Except for general background purposes, however, OER analysts could do little with this photographic information. The June 1966 issue of *Soviet Life* suggested that the Muruntau deposit might be about the same size as the Kalgoorlie deposit in Western Australia, which produced about 20 tons of gold annually. Thus, until more information became available, OER tentatively estimated that upon completion Muruntau would produce about 20 tons of gold annually.

During 1971-73, however, as overhead photographic coverage of the Muruntau complex improved, it became evident that OER's estimate was inconsistent with the size of the project and its rate of construction. The observed scale of activity at Muruntau gave credibility to claims made in the Soviet press that Muruntau would be the largest gold plant in the USSR and stimulated a re-examination of the plant's production capacity. A systematic reassessment was started in 1972, which resulted in a revised estimate of Muruntau's production capacity that was almost seven times the original OER estimate and almost 25 times estimates made by other intelligence services.

*Exploiting the Photography*

At the outset, we decided to test the feasibility of developing a methodology based on high resolution overhead photography. Although OER had used satellite photography to estimate Soviet production of copper and aluminum, photography had never been used to estimate the production capacity of a Soviet gold plant. In the early stages of the research, no one knew if photography could be used for this purpose.

Our confidence in this attempt was increased by an idea an OER analyst received from a televised news account of the damage done to a sewage treatment plant by Hurricane Agnes. A plant engineer interviewed by TV reporters commented that there was a direct correlation between the size of the treatment tanks that had been damaged and the amount of sewage the plant could process. Photography of the Muruntau plant revealed circular tanks, similar to those at the sewage treatment plant (presumably processing different materials), and we reasoned that a correlation should also exist between the size and capacity of the tanks at Muruntau.

Experts at the U.S. Bureau of Mines confirmed this, stating that as a general rule, the processing of one ton of ore per day requires three to six square feet of surface area on thickening tanks with a depth of 20 feet, the depth indicated by photography of Muruntau. This correlation is a standard engineering yardstick used worldwide to rate the capacity of gold plants, with the exact amount of surface area required depending on the elevation of the plant, the type of ore being processed, and the metallurgical process used.

The Imagery Analysis Service and the Office of Geographic and Cartographic Research were asked to perform a detailed photographic and geographic analysis of the Muruntau complex. Meanwhile, efforts were started—with the assistance of the U.S. Bureau of Mines, the U.S. Geological Survey, the Colorado School of Mines, and two of the largest U.S. gold mining companies—to ascertain the geological composition of the Muruntau ore deposit and to identify the production process used at the Mauruntau plant.

*The Results: Elevation*

Experience of U.S. mining engineers indicated that elevation affects the correlation between the surface area of thickening tanks and tank capacity. As a

general rule, more surface area is required as the elevation of the plant increases because of lower barometric air pressure. The Muruntau plant is 1300 feet above sea level and lies in a hilly, arid region, similar in climate and terrain to the high desert country of northern Nevada. Ascertaining the elevation of the Muruntau plant helped U.S. engineers to narrow the range of estimate of thickening tank surface required per ton of processing capability.

*Support Facilities*

Because of the relative isolation of Muruntau—roughly 250 nautical miles west of Tashkent, the nearest population center of any significance—the Soviets had to build extensive support facilities. These included 165 miles of rail line from the nearest terminal at Navoi, road links and powerlines, and a 155-mile water supply system from the Amu Darya river. Between 1966 and 1970 a new permanent settlement was built about 25 miles west of the plant to provide housing and day-to-day services for the Muruntau labor force. This settlement, called Zarafshan ("bearer of gold" in the Uzbek vernacular), eventually will grow to a population of 40,000.

In addition, there are three smaller housing components at the Muruntau site: housing for about 500 workers near the open pit mines; barracks for about 1,000 construction troops near the processing plant; and a prison compound for about 800 forced laborers also close to the processing plant. The prison labor is used in the dangerous task of building the underground mine.

*The Ore Deposit*

Intensive geological prospecting of the Kyzyl-Kum desert, involving some 3,000 people at its height, began in 1959 and continued at least through 1968. The decision to build the Muruntau plant apparently was based on estimates made during the early 1960s of gold in formations near the surface. This ore, which lies only six to ten feet beneath the surface in some areas, requires the removal of only light overburden and thus is suitable for cheap open-pit mining operations. Exploration from 1966 to 1968 revealed that vast reserves of gold also existed at depths as much as 7,000 feet below the surface. This ore apparently has a higher gold content than that near the surface. In 1969 the Soviets reported that the Muruntau deposit was twice as large as originally believed and that it was the world's largest proved gold deposit, with reserves that will last at least several decades.

At Muruntau the gold appears in quartz veins, similar to the Australian deposits at Ballarat and Castlemine and to formations of the Homestake gold deposit in South Dakota. According to the U.S. Geological Survey, the Muruntau deposit is described technically as a low-sulfide, quartz-pyrite-arsenopyrite formation.

The gold content of the Muruntau deposit could not be ascertained exactly. However, we had good reasons for believing that it was not less than 0.15 troy ounce of gold per ton of ore—about one-half the gold content of typical ores mined in the United States and South Africa. First, experts in the U.S. gold industry and U.S. Bureau of Mines estimated a probable gold content of at least 0.15 troy ounce per ton based on a study of the Muruntau deposit by the late Mr. Douglas Alverson of the U.S. Geological Survey. Mr. Alverson, a professional geologist and fluent Russian linguist, provided OER with a detailed study of the Muruntau deposit along with comparisons of this deposit with analogous ore bodies in non-Communist countries.

Second, published results of tests conducted by the Soviets in 1967 on ore samples from new quartz deposits in the USSR—almost certainly including Muruntau—showed an average gold content of 0.15 to 0.57 troy ounce per ton. These results were published in the Soviet *Journal of Nonferrous Metals.*

Third, the Soviets have compared the Muruntau deposit to the Kommunar deposit in the Altai Kray which, according to information published in Soviet technical journals, contains an "average industrial content" of gold. The system of mineral classification described in Soviet publications indicates that "average industrial content" means at least 5 grams (0.16 troy ounce) of gold per ton of ore. The second part of the puzzle had fallen into place.

*The Central Processing Area*

The processing plant is located on a plateau about 3 miles west of the open pit mining area and at an elevation of 800 feet relative to the mine. (See Figure 1.) It is connected to the mining area by a rail shuttle. The plant, which covers an area of 150 acres, is the largest gold plant in existence. It contains four major production facilities: a) a mill building 2,130 feet long; b) 18 circular thickening tanks, each 165 feet in diameter; c) two buildings housing cylindrical tanks (called Pachuca mixers) to extract gold from solution; and d) a refinery 435 feet long. Detailed photographic analysis of the thickening tanks yielded two vital pieces of information. First, we could measure the diameter of the tank, and hence calculate its surface area. Second, the tanks were constructed on exactly the same level, and there was no evidence of any internal piping between them; hence, each tank operated as an independent unit. In contrast, thickening tanks in U.S. gold plants are installed in a descending pattern, and the slurry is thickened sequentially, using gravity to move the slurry from one tank to the next. (Ground photography of typical thickening tanks and Pachuca mixers at Muruntau is shown in Figures 2 and 3.)

*The Cost*

Muruntau is the largest project ever carried out in the Soviet gold industry and is probably the most expensive undertaking by any gold industry in the world. On the basis of U.S. experience, we estimated that this project, including infrastructure, would cost $620 to $680 million (in 1974 dollars) if it were undertaken in the United States. The most expensive part of the project, the processing facility, probably would cost $375 million when outfitted with machinery and equipment. This is roughly six times the capital valuation of the largest gold plant in the United States and three times the average of South African plants.

*The Production Process*

The refining process at Muruntau is defined in metallurgical terms as an ion exchange in the pulp process. Although Muruntau is the only plant in the world that currently uses this technique to recover gold, the technology involved is well known and is used widely in uranium processing plants in the United States. The process involves five basic steps: crushing; grinding; thickening; extraction of gold with ion exchange resins; and final refining. (See Diagram, Figure 4.)

At Muruntau, the ore is transported to the plant from the mines by a standard-gauge rail line. Primary crushing of the ore occurs underground between the railcar unloading facility and the mill building. Secondary crushing and grinding of the ore

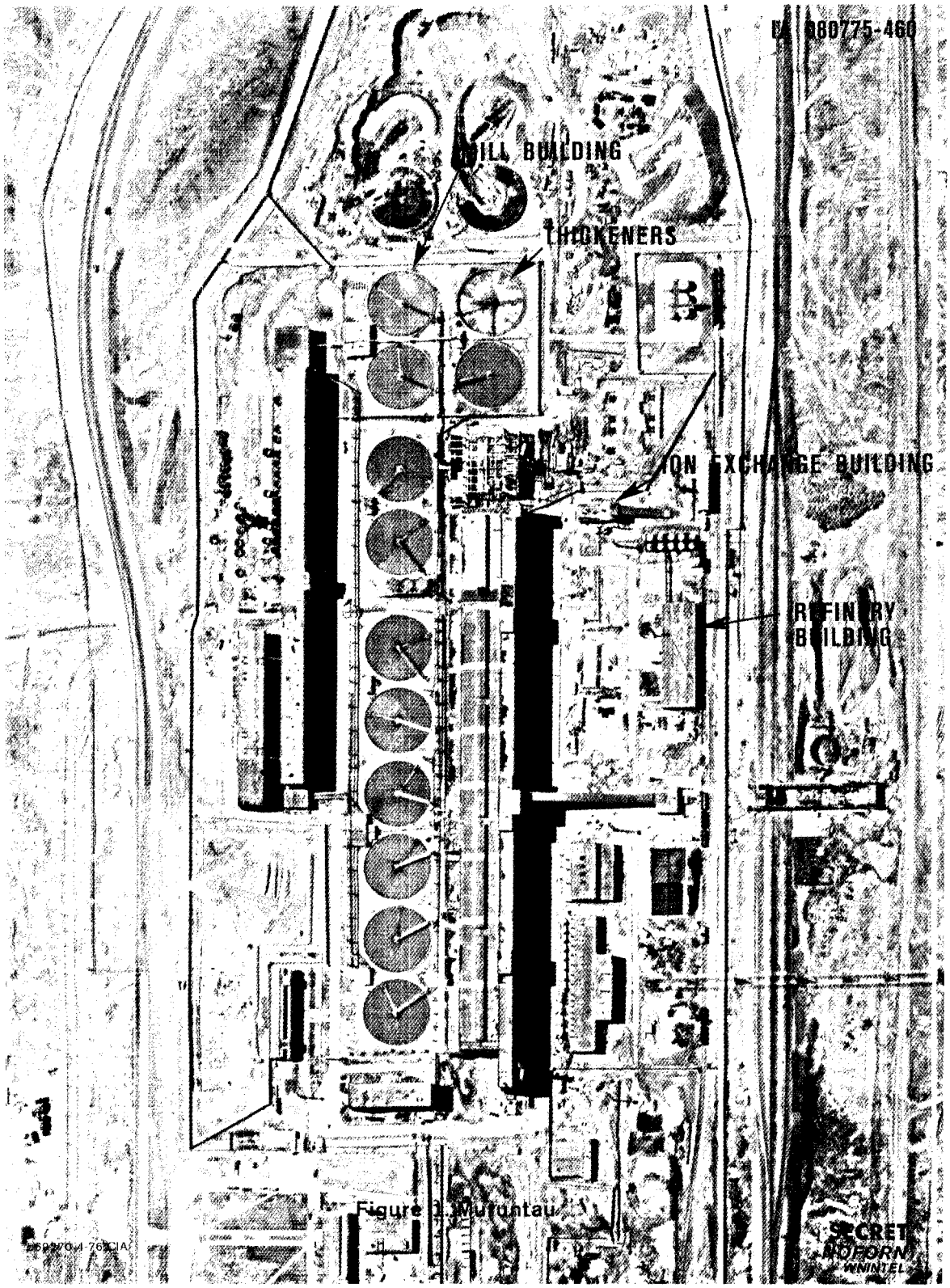



Figure 1. Mufulira

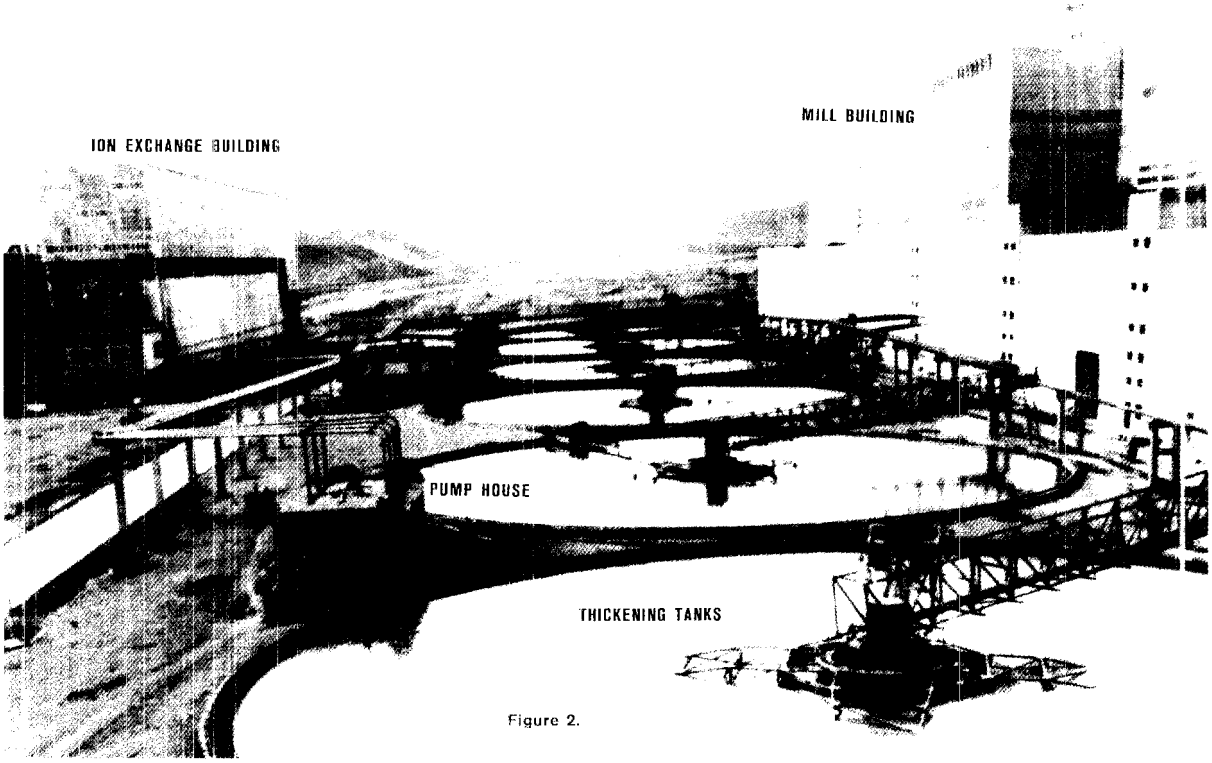
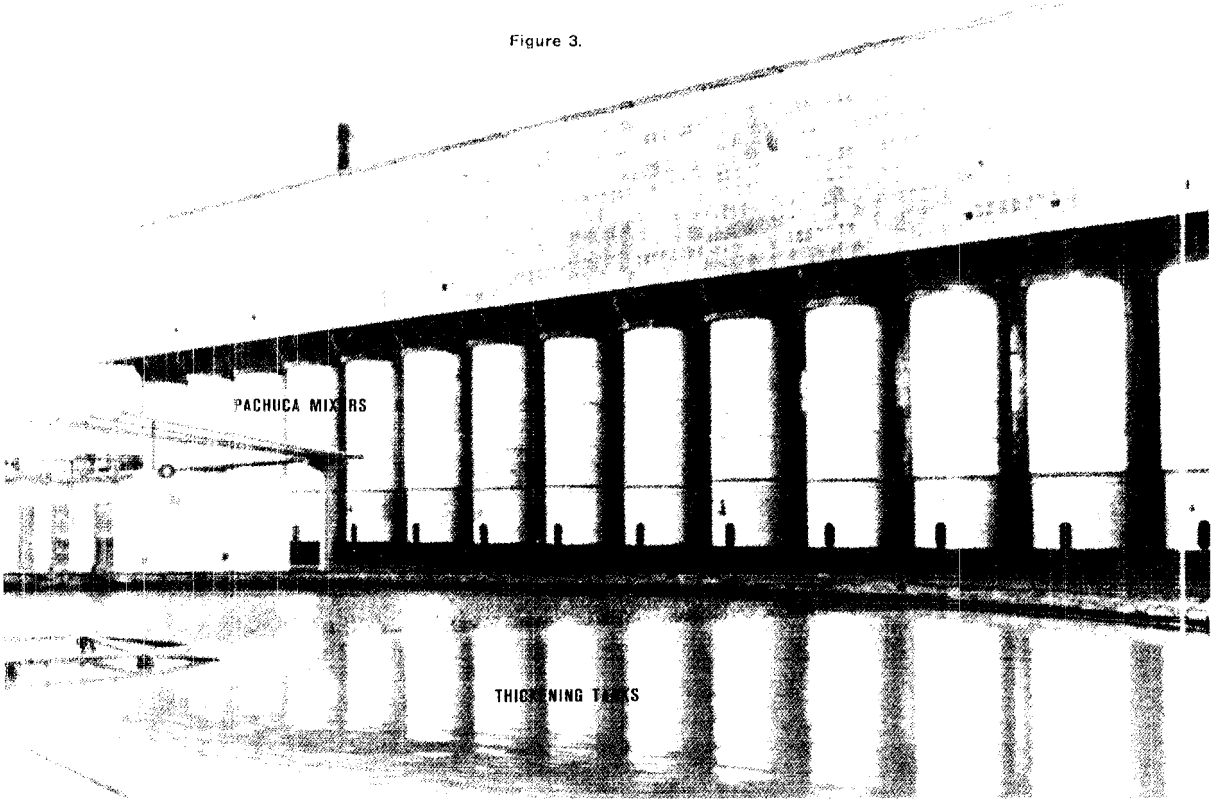



Figure 2.

Figure 3.

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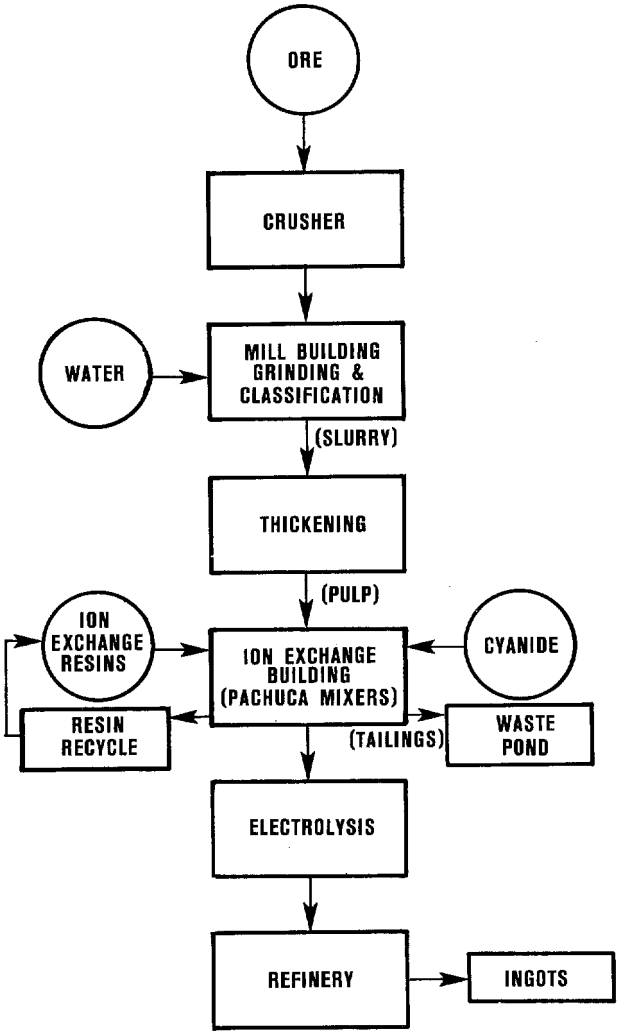


Figure 4. Ion Exchange in the Pulp Process
(Simplified Flow Diagram)

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takes place in the mill building. The ore is ground to a fine powder. Water is added in the final grinding stage to obtain a water solution, or slurry, with a solid content of about 15 percent. The slurry is sorted in spiral classifiers to insure uniform fineness and then is pumped from the mill building to the thickening tanks.

In the thickening tanks, the solid content of the slurry is raised to about 50 percent by allowing the solids to settle to the bottom of the tank, a process taking 16 to 18 hours. Rotating rake arms push the settled solids toward a discharge point at the center of the tank bottom. When the desired 50/50 liquid-to-solid ratio is achieved, the viscous residue, called pulp, is pumped through pipes to ion exchange buildings.

The ion exchange buildings house the Pachuca mixers. The pulp enters the mixers and is dissolved in a cyanide solution for about 10 hours to form the electrolyte sodium gold cyanide—$NaAu(CN)_2$. The electrolyte is then treated with ion exchange resins (plastic polymers with an affinity for gold) which extract the gold from the electrolyte. Resins that have stripped gold from the electrolyte are removed from the Pachuca mixers and pulverized to a powder.

Gold is separated from this powder by an electrolytic process in which gold is deposited on titanium sheets (cathodes) set in electrolytic cells and then manually peeled from the cathodes. At this point the gold has a purity of 99 percent. Such a degree of purity cannot be achieved prior to final refining by other processes. Final purification of the gold is performed in the refinery, adjacent to the ion exchange building, using a fire refining process to produce gold that is 99.99 percent pure. Muruntau is one of only two plants in the USSR capable of producing gold with this purity. The other is the All-Union Precious Metals Plant in Novosibirsk, which performs final purification for all the gold produced in the Northeast Region.

*Construction Chronology*

Photographic analysis indicates that the processing complex was designed from the beginning in 1967 for the configuration that it will have upon completion. This was not apparent until recently, however, because construction has proceeded in three stages.

The cornerstone of the plant was laid on 14 May 1967, according to Soviet press sources, and construction proceeded rapidly thereafter. Photography of March 1968 showed the frame of a mill building 500 feet long, part of the roof structure in place, three thickening tanks under construction, and the ground cleared for three more tanks. On 12 June 1969, the first gold was produced and ceremoniously announced in the Soviet press, and on 1 July 1969 the plant was officially commissioned. Photography of January 1971 revealed that the length of the mill building had been extended to 1,100 feet and that the six thickening tanks had been completed. In addition, an ion exchange building housing 28 Pachuca mixers, and a refinery 435 feet long had been built.

Photography of July 1973 revealed that additional construction had doubled the capacity of the Muruntau plant. The mill building had been extended 400 feet, six additional thickening tanks were installed, and a second ion exchange building, identical to the first, had been completed. Photography of April 1974 revealed that the mill building is being extended by an additional 1,000 feet, six additional tanks are in various stages of construction, and a third ion exchange building is in an early stage of construction. The pace of construction as observed in mid-1975 suggests that the facilities will be completed and fully operational by 1977. Space limitations imposed

by other buildings and topography indicate that further expansion of the central processing area is unlikely. (A comparison of the three stages of construction of the Muruntau, identified as Stages 1, 2, and 3, is shown in Table 2.)

Having gained an understanding of the key aspects of the Muruntau plant, and of the pace of its construction, we were in a position to begin integrating all the disparate information into a formal methodology for estimating the capacity of the plant.

*The Methodology*

We concluded that the capacity of any gold plant can be estimated with a high degree of accuracy on the basis of the following information: a) the surface area of the thickening tanks; b) the number of tanks installed; c) the settling characteristics of the ore—that is, the rate at which the powdered ore precipitates from the slurry in the thickening tank. For any particular settling rate, the amount of gold-bearing ore that can be processed per unit of time is directly correlated with the surface area of the thickening tank.

In the case of Muruntau, U.S. engineers estimate that four square feet of thickening tank surface area are needed to process one ton of ore per day. This estimate is based on the elevation of the plant, the settling characteristic of the ore, and the production process. In the extreme, no more than five square feet would be needed. Upon completion of present construction, Muruntau will have 18 thickening tanks, each with a surface area of 21,382 square feet, or a total surface area for all tanks of about 384,876 square feet. Hence, at four square feet per ton, Muruntau could process 96,200 metric tons of ore per day, and at five square feet, 77,000 metric tons.

Given a range for the amount of ore that can be processed, final output of gold will depend upon the gold content of the ore, the rate of plant utilization, and the recovery rate. We had estimated the average gold content of the ore at 0.15 troy ounce per metric ton at a minimum. Some experts in the U.S. gold industry argued that the probability was high that the ore was richer, perhaps 0.20 troy ounce per metric ton. In the judgment of U.S. engineers, the Muruntau plant probably operates at 95 percent of capacity (which is a fairly standard plant utilization rate in the gold industry), although a higher utilization rate is possible. Lower rates of utilization are unlikely. Finally, it is unlikely that the recovery rate at Muruntau is less than 92 percent. (The

**Table 2**

**Sequence of Construction at Muruntau**

| | Stage 1 Complete As of January 1971 | Stage 2 Complete As of April 1974 | Stage 3 Under Construction As of April 1975 | Total Plant |
|---|---|---|---|---|
| Length of Mill (feet) | 1,100 | 230 | 580 | 2,130 |
| Number of Thickening Tanks (units) | 6 | 6 | 6 | 18 |
| Area of Thickening Tanks (square feet) | 128,295 | 128,295 | 128,295 | 384,885 |
| Ion Exchange Buildings | 1 | 1 | 1 | 3 |
| Pachuca Mixers (units) | 28 | 28 | 28 | 84 |
| Capacity of Mixers (cubic feet) | 630,000 | 630,000 | 630,000 | 1,890,000 |
| Length of Refinery (feet) | 435 | — | — | 435 |

recovery rate is the amount of gold actually recovered as a percent of the total that would be recovered if the production process were perfect.) In U.S. practice, recovery rates normally exceed 95 percent and on occasion run as high as 98 percent. The effects of these variants on the annual output of gold (based on a 360-day work year) are shown below for two cases.

The tabulation summarizes the possible ranges of output at Muruntau. The widest range implied is from 112.9 to 208.9 metric tons per year. Only the values given in Case 1 for 95 percent capacity utilization were considered to be "real" possibilities, however. Thus, potential output at Muruntau falls within a range of 112.9 tons to 148.9 tons. The mean and median value is 130.9 tons.

A crosscheck, calculated by an alternative technique, supports a somewhat higher figure. Output was computed for crosschecking purposes on the basis of the dimensions of the Pachuca mixers, because a correlation exists between the volume of a mixer and its processing capability per unit of time. Analysis of ground-level photography published in *Sputnik*, a Soviet magazine, revealed that the volume of each mixer is about 22,500 cubic feet. When present construction at Muruntau is complete, 84 mixers, with a total volume of 1.89 million cubic feet, will be in place. U.S. experts calculated that about 20 cubic feet of mixer are needed to process one ton per day. By dividing total volume by the constant factor of 20 cubic feet, it follows that the Pachuca mixers have a daily throughput capacity of 94,500 tons, compared with 77,000 to 96,200 tons calculated on the basis of the surface area of the thickening tanks. Applying the same values for ore richness (0.15 troy ounce) recovery rate (92 percent), and plant utilization rate (95 percent) yields an estimate of 138.7 tons of gold per year. As a "best" estimate, 135 tons of gold per year was used. This figure is both the mean and median value of the estimates derived from the thickening tank and Pachuca mixer estimating techniques.

*Significance of Muruntau*

Using the foregoing methodology, in conjunction with photographic information on the rate of plant construction, OER estimated that gold production at Muruntau increased from 1 ton in 1969 to 45 tons in 1974. In 1975 the plant was capable of producing 90 tons, and upon completion of present construction in 1977 it will have a capacity of 135 tons. (See Table 4.) These estimates are supported by a Soviet

**Table 3**

| Recovery Rate | Case 1[a] 4 Square Feet[b] | Case 1[a] 5 Square Feet[b] | Case 2[a] 4 Square Feet[b] | Case 2[a] 5 Square Feet[b] |
|---|---|---|---|---|
| | *Metric Tons* | | | |
| At 100% of capacity | | | | |
| 92% | 148.6 | 118.9 | 198.3 | 158.5 |
| 97% | 156.7 | 125.4 | 208.9 | 167.2 |
| At 95% of capacity | | | | |
| 92% | 141.3 | 112.9 | 188.2 | 150.6 |
| 97% | 148.9 | 119.1 | 198.6 | 158.8 |

[a]Case 1 is based on an ore content of 0.15 ounce per ton, Case 2 on a content of 0.20. Recovery rates of 92% and 97% are specified at plant utilization rates of 100% and 95%.
[b]Surface area needed to process one ton of gold-bearing ore.

**Table 4**

**Gold Production in the USSR,**

*(Metric Tons)*

| Year | Muruntau | All Other | Total |
|---|---|---|---|
| 1969 | 1 | 191 | 192 |
| 1970 | 5 | 196 | 201 |
| 1971 | 20 | 198 | 218 |
| 1972 | 45 | 207 | 252 |
| 1973 | 45 | 216 | 261 |
| 1974 | 45 | 225 | 270 |
| 1975 | 90 | 236 | 326 |
| 1976 | 90 | NA | NA |
| 1977 | 135 | NA | NA |

monetary specialist who confided to a former member of the President's Council of Economic Advisors that output at Muruntau will be at least equal to that of Magadanskaya Oblast, traditionally the country's largest gold producing area. Magadanskaya Oblast currently produces about 85 tons of gold annually.

Muruntau's production in 1974 surpassed total U.S. output of 35 tons and was not far behind that of Canada (52 tons). Muruntau's production in 1975 probably was six times that of the largest gold plant in the United States and surpassed the record level of 88 tons achieved by the largest South African plant at West Driefontein in 1971. When Muruntau is complete and fully operational in 1977, its annual output will account for about 40 to 45 percent of total Soviet gold production.

During 1975-77, Muruntau will produce an estimated 315 tons of gold, which at free market prices of $170 per ounce could bring in about $1.7 billion in hard currency to help the Soviet government pay for imported grain and badly needed Western equipment and technology. Without meaning to, OER seems inadvertently to have given some credibility to an old Uzbek proverb, "In the Kyzyl-Kum desert, it is harder not to find gold than to find it."

OER now is working to apply the methodology developed for the Muruntau gold plant to other nonferrous metals plants. The most promising possibility is a new gold plant the Soviets are building at Zod, on the eastern slope of Mt. Ararat, in the Armenian SSR. This plant is under construction and is similar to Muruntau in external configuration, but smaller. According to published Soviet press reports, it will also use an ion exchange in the pulp process. As more photography becomes available, and as we obtain more information on the geological composition of the Zod deposit, an estimate of the capacity of the Zod plant will be made, thereby further unraveling the "secret" of Soviet gold production.

*From SAWRF to FADS to LMS*

# THE GREAT CHINESE MOUNDS PUZZLE

**Bruce Smith**

The Chinese have built 18 mounded structures that have no counterparts any place else in the world. The intelligence community, at least a large part of it, has labeled these installations Large Mounded Strongpoints (LMS*). They are generally believed to be defensive positions to protect strategic invasion corridors leading into the country. When these structures were first discovered in the mid-1960s, they created great excitement in intelligence circles. Because some of them were located near Shuang-ch'eng-tzu, China's first missile test center, the curious mounds were called SAWRFs (see Map, Figure 5). The acronym stood for Suspect Advanced Weapons Related Facility. This essay traces some of the events which ultimately led to downgrading the mounds from something exotic into the more mundane conventional weapons field.

## *Description of the Mounds*

The mounds were in an early stage of construction when first seen in satellite photography in 1966. They appeared to consist of long narrow corridors built at ground level on flat, open land. Shorter passageways led from the main corridors to the perimeters, and rooms were located off the corridors in a staggered fashion.

At later stages of construction, the networks of corridors and rooms were mounded with earth to form huge man-made hills, each covering an area larger than the Pentagon. They ranged in size between 1,000 and 1,500 feet long, 500 to 900 feet wide, and 70 to 125 feet high (see Figure 6). All the mounds are surrounded by a water-filled moat, except for the one near Shanghai, which is located on the bank of a river.

## *The Intelligence Response*

Nothing resembling China's mounds had ever been seen before, and their uniqueness led to a great stir among intelligence analysts. Typically, the vast resources of the U.S. intelligence apparatus were mobilized to determine the purpose of the curious mounds. Every agency of the intelligence community participated in the task. Coordinating responsibility for the effort was vested in one of the committees of the USIB.

Outside experts from a variety of disciplines, including construction engineers, nuclear physicists, geologists, hydraulic engineers, military engineers, and China scholars were provided with data and asked to give their opinion on the function of the mounds. Satellites were programmed to obtain repeated coverage of the mounds from every possible angle. Hundreds of photographs were taken and each one carefully scrutinized by photo interpreters in Imagery Analysis Service (IAS) and the National Photographic Interpretation Center (NPIC). Modelers built relief models, artists drew concepts, and photo interpreters measured and remeasured all visible features of the mounds.

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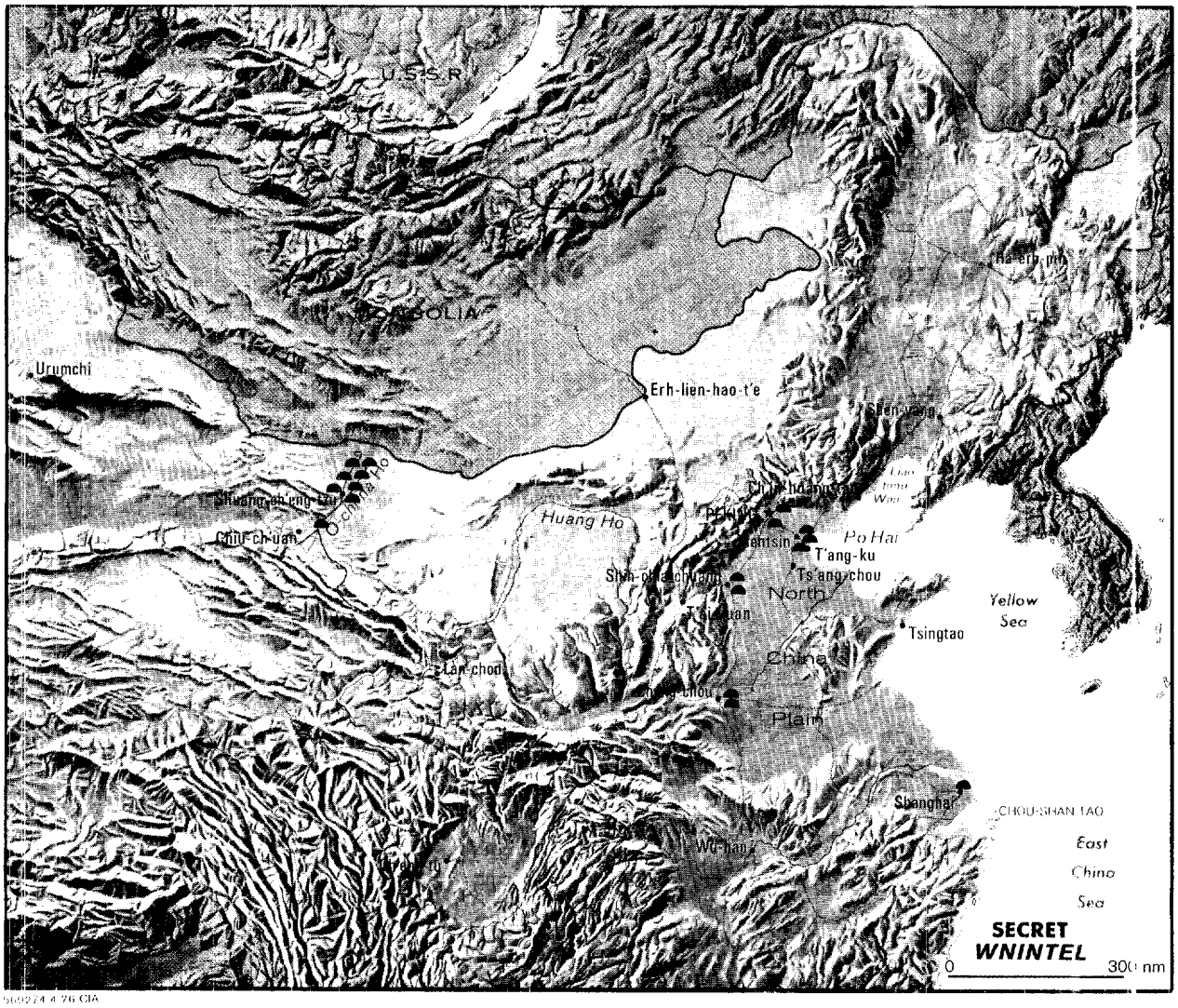
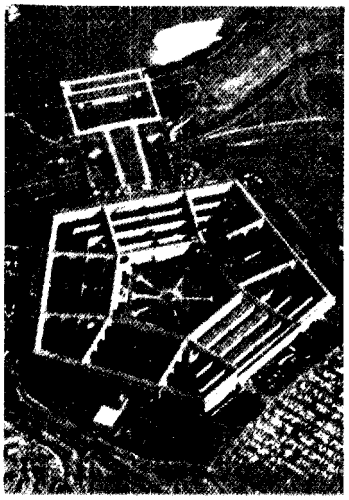
*Pronounced "limbs."

Figure 5. Large Mounded Strongpoints in China



Shuang-ch'eng-tzu 6 - corridor pattern complete, prior to earth covering



Pentagon Building in roughly the same scale as the mounded structure at right

Peking East mounded structure-earth mounded and moat water filled

Figure 6. Large Mounded Structures

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In addition to IAS, other offices within CIA who volunteered their unique expertise in the great quest to unravel the mystery of the mounds included OSI, OSR, FMSAC, DDO, and OBGI. Within the military establishment, the Corps of Engineers, DIA, and NSA developed a coterie of "mound experts." In all, thousands of man-hours and undoubtedly hundreds of thousands of dollars went into the mammoth effort. Conferences were held, foreign intelligence organizations were queried, and reams of paper were consumed by the topic. One battle-hardened veteran of the mound scene even coined a new vocabulary to improve communications between the hundreds of experts working on the problem and the outside world.*

*Early Hypotheses*

The massive mobilization of intelligence resources during the late 1960s produced a number of scholarly hypotheses explaining the purpose of the so-called SAWRFs. Some thoughtful ideas seriously put forward included:

- Rain-making devices
- Blood storage vaults
- Memorial halls to enshrine the thoughts of Mao
- Personnel shelters
- Communications centers
- Atomic weapons storage vaults
- Strategic missile launch sites
- ABM sites
- Utility plants for electric power
- Solar pumps
- Hospitals
- Tombs or crematoria
- Sites to cultivate mushrooms

The Soviet Union also was interested in ascertaining the purpose of China's mounds. In early 1969, a Soviet official approached a high-ranking U.S. intelligence officer, allegedly at a cocktail party in Washington, and queried the American on the purpose of the structures. The Soviets, like some U.S. intelligence analysts, apparently

*Part of this unique vocabulary included such terms as:

SAWRF—A Chinese puzzle built in committee
SAWRFLET—A mini-SAWRF
SAWRFETTE—A female SAWRF
LUMPIE—A dead SAWRFLET
SAWRFOID—A neuter SAWRFLET
SAWRFAGE—Effluent from a SAWRF
SAWRFITIS—Inflammation of the corridor system
SAWRFLING—An adolescent SAWRF
SAWRFOBIA—Fear of being assigned SAWRF responsibility
SAWRFNIK—A U.S. intelligence officer who, knowing nothing about the subject, becomes chairman of a working group convened to determine its function

thought the mounds were associated with advanced weapons. The Russian told the American that:

> Adjacent to the border of Mongolia there are in the construction stage several launching pads of semi-subterranean type. There are 28 launching pads there altogether. In the area of Peking and to the south of it there are several launching pad complexes of the same type under construction with direction of fire to the southeast.

*The First Crack in the Puzzle*

For more than two years after the mounds were discovered, no one adequately explained why the Chinese were building the strange structures. Every theory was weak and could easily be shot down for one reason or another. In fact, people took great delight in shooting holes in the various hypotheses put forward. Each analyst, naturally, wanted to become the first detective to break the case and thus reap the benefits of an intelligence coup. But SAWRF was not fated to be pruned down to LMS until somebody applied "Occam's Razor" to the increasingly complicated theories, and then indulged in some fancy coordination footwork to propagate the simplified result.

Into the den of sharpshooters aiming at all the proffered solutions walked three unsuspecting lambs who had developed a new and simplistic hypothesis to explain the mounds. (Why look for an abstract answer before considering the simple ones first?) Two of them, Kenneth C. Fuller and William Trimpin, worked for the now-defunct Construction Branch in OER. A third man, working independently, had written a brief memorandum in late 1968, outlining his theory that the mounds were "essentially land fortifications associated with future deployment of conventional defensive weapons, most likely field artillery pieces, to be used against ground invasion forces."

At about the same time, the two analysts in the Construction Branch reached an identical conclusion. It appeared to them that the Chinese were building man-made hills in flat areas in order to control the only high ground along traditional invasion corridors leading into the country. They based their conclusion, in part, on voluminous information supplied by photo interpreters working at IAS (particularly helpful among these unrecognized heroes at IAS were Mr. Ed. Parris, Mr. Frank Filmore, Mr. Charles Balyeat, and Mr. Kim Fitzgerald).

*SAWRFs Become FADS*

Now that the problem had been solved—at least in the view of the Construction Branch—the first order of business naturally was to dream up a new acronym describing the mounds. After considerable thought, the term "FADS" was chosen. This stood for Flat Area Defensive Strongpoints (some people interpreted the term to mean that China's mounds were nothing more than passings fads).

Armed with a descriptive new name for the mounds, the analysts in OER felt they would have little trouble selling the idea that China's mounds were defensive strongpoints. This did not prove to be the case. The intelligence community was not yet ready to accept the weird thesis that SAWRFs were actually FADS and that a FADS was in reality an LMS, the name now accepted for the structures.

When verbal discussion fails to sway a debate, sometimes the pen proves to be mightier than the tongue. The Construction Branch, therefore, decided that the best method to convince a skeptical audience was to compose a memorandum outlining the

reasoning why SAWRFs were FADS. A detailed memorandum was written and disseminated to as many SAWRFNIKs within CIA as possible in an attempt to influence the course of the discussion decisively. (A copy of this original memorandum follows this essay, for those newcomers who are interested in the early reasoning behind the argument downgrading the SAWRFs.)

The reaction to the inter-office memorandum was mixed. Some readers were not moved by the argument, while others considered it a decisive piece of analysis. Agreeing with this latter group, the OER team decided to push on with the selling campaign. The next move in the game was to write a formal CIA report on the topic in order to convey the message to other parts of the U.S. Government. The main problem with writing a formal Intelligence Memorandum at that time, however, was the requirement that such reports should be coordinated with all interested offices prior to publication. Given the controversial nature of the topic, there was an excellent chance the paper would have been killed before seeing the light of day. Thus, a plan was devised to publish the FADS thesis in a way that would minimize the problems of coordination.

*An Approach that Worked*

The approach adopted to outflank the expected opposition was to write an Intelligence Memorandum discussing China's massive underground construction program then under way at airfields, naval bases, storage sites, and other installations. During the late 1960s, this topic was of considerable interest because of the U.S. involvement in Vietnam and the worsening situation along the Sino-Soviet border. The discussion of the FADS hypotheses was introduced into the "underground paper" as an apparent afterthought and comprised only a minor part of the presentation. The objective was to slip the FADS idea into formal print under a broader topic of general interest. The paper was coordinated only with those offices who would readily agree to sign off. It was not shown to many of the specialists working on the SAWRF problem.

The IM was published as a formal CIA report in May 1969. Although the debate on the mounds continued to drag on for some time after the IM was disseminated, general agreement was finally reached that the structures probably were defensive fortifications when 130 mm artillery pieces were observed protruding from the entrances.

The most recent CIA paper written on the mounds was published in April 1974 by the Office of Strategic Research. This report reviewed the latest evidence on their tactical capabilities and potential effectiveness for defense against invasion. The acronym "FADS" never caught on, but the original OER analysis has stood up well. Of course, the final chapter on China's great mounds may not yet have been written. A time may come when new evidence will rekindle interest in the mounds. Perhaps the FADS thesis will eventually be disproved when one of the mounds suddenly bursts open like a rosebud and a gigantic missile roars off from a subterranean pad. Or some bright young analyst may come along who can logically explain why the Chinese would build eight of the mounds in the sparsely populated Gobi Desert to use as blood storage vaults, communications centers, electric power plants, hospitals, or crematoria. Perhaps the mounds will finally turn out to be ideal places to enshrine the voluminous writings of Mao after he leaves the scene. Finally, the hypotheses that the mounds are rain-making devices or sites to cultivate mushrooms may prove to be the ultimate answer. In any case, the great mounds should provide interesting puzzles to archeologists digging in China five thousand years from now. (See Figure 7).

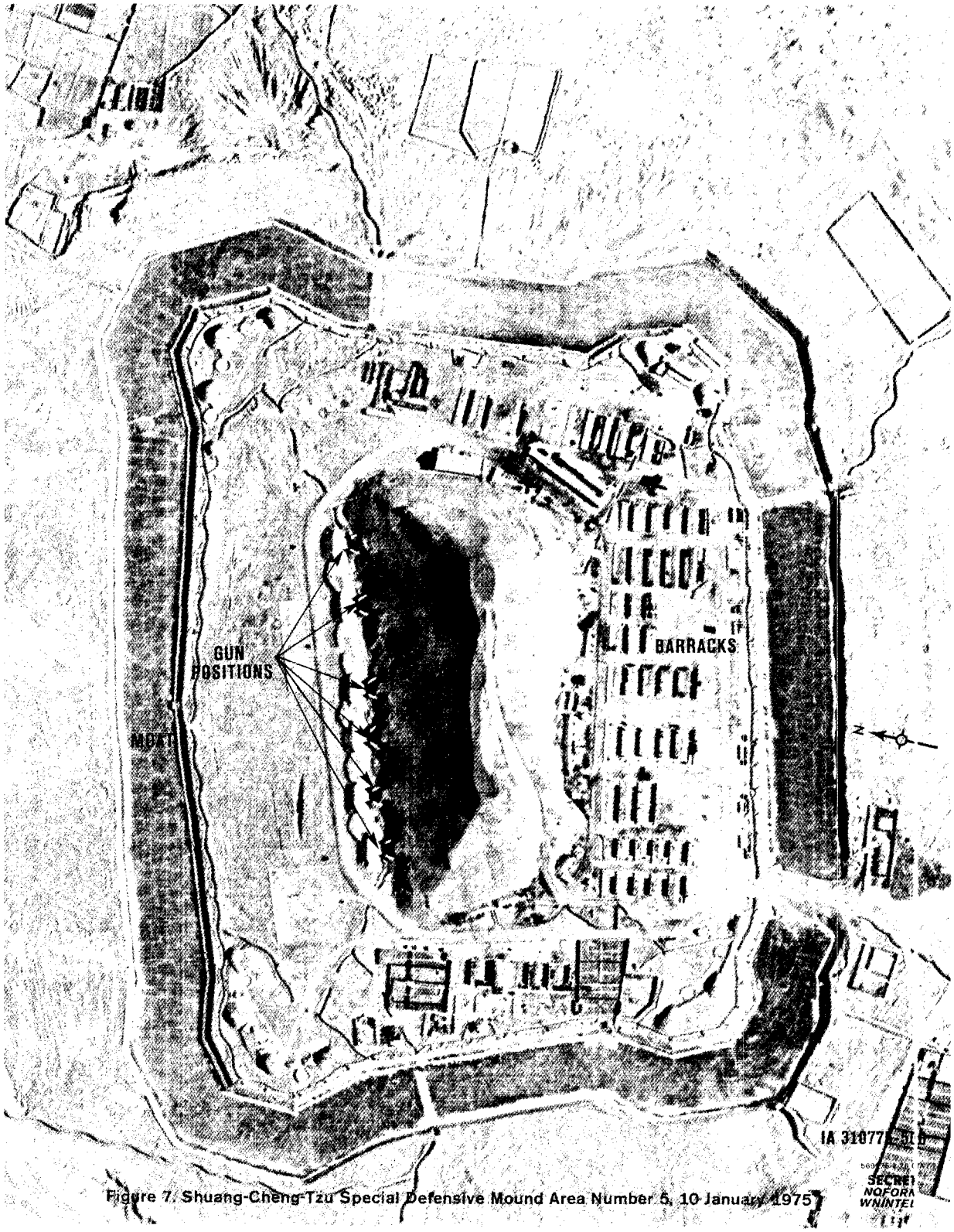


Figure 7. Shuang-Cheng-Tzu Special Defensive Mound Area Number 5, 10 January 1975

**(CIA Memorandum)**

14 March 1969

*Probable Purpose of "SAWRFs"*

1. There has been considerable discussion during the past few years about the function of eleven (probably fifteen) unidentified construction projects in China. Although the intelligence community has postulated many theories to explain their function, there has been no consensus and the projects have temporarily been designated Suspect Advanced Weapons Related Facilities (SAWRFs). Speculation on their purpose includes strategic missile deployment sites, atomic weapons storage vaults, communications centers, command and control centers, personnel shelters, memorial halls to enshrine the thoughts of Mao, and even rain-making devices. The interesting possibility has been raised elsewhere that SAWRFs are nothing more than land fortifications associated with a future deployment of conventional defensive weapons—most likely field artillery pieces—in a defensive role against ground invasion forces. OER's Construction Branch, International Services Division (IS/CST) independently arrived at the same conclusion, with the caveat that SAWRFs could also be used for the deployment of artillery rockets as well as conventional field artillery pieces.

2. There is general agreement within CIA (not DIA) that SAWRFs are too small to house strategic missiles (MRBMs or IRBMs) and are poorly placed in China to store nuclear weapons. SAWRFs as a group also are located in the wrong places to be personnel shelters, storage sites, communications centers, or command and control centers. Many factors, however, support the theory that SAWRFs are defensive positions to protect against an invasion by sea or over land. The more important reasons supporting this thesis include methods of construction, physical configuration, location, tactical orientation of the SAWRFs, and the nature of other related construction projects in the field of national defense.

*SAWRFs are only the Tip of the Iceberg*

3. There have been many reports that mention China's effort to construct a series of defensive positions in the country, from a first line along the coast and border regions to second and third lines farther inland. A number of sources have discussed in some detail the coastal defense works the Chinese have been building since the early 1950s. These coastal gun sites are hardened and typically have two, four, or six entrances (generally four) facing toward the sea. Many of these sites closely resemble SAWRFs in configuration and layout.

4. A Chinese Army officer who defected also discussed the military construction program in China's southwest border area, where a system of "national defense works" was built in the mid-1960s. The works were constructed underground to defend natural invasion routes against penetration by enemy forces. These fortifications reportedly are of reinforced concrete construction, have good antigas, antifire, anti-aircraft characteristics and protect against atomic fall-out. The SAWRFs have all of these characteristics and are placed astride some of the most important invasion routes leading into the country.

*SAWRF Construction*

5. SAWRFs are esentially nothing more than tunnels that have been erected on a flat plain, rather than drilled through rock or cut and backfilled as in hilly terrain. After the corridors and rooms have been poured in place at ground level, they are covered with layers of earth and rock to form a man-made hill. The outward appearance of a SAWRF is similar to scores of defensive positions in other areas of China and North Vietnam that have been drilled or cut into the mountains rather than built from the ground up. Constructing hills where none exist is an expensive and time-consuming undertaking, particularly when there are natural hills within 25 to 50 miles, and implies that the location of a SAWRF is of decisive importance.

*Location in the East*

6. A knowledgeable historian wrote, "the fight for the control over China is in effect a fight for the control over the 'A' formed by three major rail lines—the Tientsin-Nanking, the Peking-Hankow, and the Lunghai line (the east-west line running through Cheng-chou) and the cities along them." The SAWRFs in east China are all located near important junctions along this critical "A". Railroads are the primary means of transportation in China, and the rail system in the east consists of two north-south trunk lines and four east-west connecting links. Three of the four east-west rail lines continue inland from their junction with the Peking-Hankow-Canton trunk line, and SAWRFs are located near all three of these major junctions. This placement indicates a systematic plan to defend important rail hubs and industrialized centers farther inland.

7. The two SAWRFs near Peking are strategically placed about 15 miles south and southeast of the city to defend the coastal approaches to the capital. These SAWRFs are adjacent to the only two main lines of communication (LOC's) running directly between the capital and the Gulf of Chih-li—a double-tracked rail line and an all-weather two- or three-lane highway. Each Peking SAWRF is constructed with four entrances on one side and two on the other. The sides with the four entrances face directly toward the sea coast and provide a logical field of fire for a defensive position.

8. The two SAWRFs at Shih-chia-chuang also are strategically placed to defend important LOC's. They are located about 10 miles from the city and are near the only rail line and highway in the area leading directly from the coast. The orientation of the Shih-chia-chuang SAWRFs is similar to the Peking SAWRFs. The sides with the four entrances face the coast, which also provides a logical field of fire for a defensive position.

9. Construction of the two SAWRFs at Cheng-chou has not progressed far enough to determine all of their characteristics. Both of these SAWRFs, however, are near the main railroads and highways running into Cheng-chou from the east and the south and are located facing invasion routes.

10. Two possible SAWRFs are in an early stage of construction straddling the railroad line between Tientsin and T'ang-ku. The layout of the sites is nearly identical with that of the other SAWRFs, but because of very marshy conditions their preparation differs from methods followed elsewhere. At one location, fill material is being brought in by rail to provide a foundation mat for the SAWRF. At the other location, which is in even worse soil, piles are being driven on the site of the future SAWRF. The construction of these two facilities under unfavorable soil conditions emphasizes the importance of the location, i.e., on the coastal side of a major city,

astride the main transportation lines, and oriented towards the direction of potential invasion.

*Near Shuang-ch'eng-tzu*

11. Five SAWRFs have been firmly identified near the Shuang-ch'eng-tzu Missile Test Range (SCTMTR), and one or two others may be in the initial stages of construction. All of these structures are located from 50 to 100 miles north- northeast of the main support base, in the mouth of a likely invasion corridor leading across the Gobi Desert from Mongolia. The river basin where the SAWRFs and test range are located contains the only fresh water in the area and is the only region in north central China suitable for north-south cross-country movement of wheeled or tracked vehicles. This river basin also leads directly to the strategic Kansu Corridor, the gateway to Yumen, Lanchou, and other advanced weapons centers in the northwest. The Gobi SAWRFs, therefore, are not placed there exclusively to defend SCTMTR but rather to block the natural invasion route. Lin Piao may have been referring to SAWRFs in the Gobi when in mid-1968 he reportedly discussed "national defense construction works by forces stationed in desert regions."

12. SAWRFs are apparently only part of other defensive precautions taken by the Chinese near the test range. There are a few ridge lines south of the SCTMTR rangehead and many of them are riddled with tunnels which constitute an additional line of defense. Some of the excavations may be small scale mining operations, but the others are probably gun positions, storage sites, and personnel shelters. Photography indicates that the majority of these tunnels were excavated during the past few years.

*Similarities to Defensive Positions in North Vietnam*

13. An NPIC Study on "Probable Cave Defense Sites in North Vietnam" draws a number of conclusions which apply to the location and orientation of SAWRFs in China. When the study was published in January 1968, photography had identified 37 sites in North Vietnam that were under construction or recently completed. Twenty-seven sites had four symmetrically arranged entrances and are similar to coastal defense sites in North Vietnam and China. In many instances, the natural topography had been ignored in an attempt to achieve symmetry in both orientation and separation of the entrances. The tunnel sites are located up to 80 miles *inland* and are generally dispersed along an east-west line corresponding with the main route between Hanoi and Vinh. Most of the entrances are oriented towards these routes. NPIC concludes that "the construction pattern indicates that the primary function of the tunnels was probably as defensive artillery sites in anticipation of a land invasion." Many of the sites, moreover, are believed to have been built by Chinese engineering troops.

*Use of Local Labor*

14. Projects with top military priority in China in the advanced weapons field are built by well-trained and closely-screened military engineering troops. For security reasons, there is no attempt to recruit local laborers to build highly sensitive projects. When building more conventional military projects, however, the Chinese follow their traditional approach and employ a combination of mechanized construction equipment and local unskilled labor. Such projects include airfields, POL storage sites, strategic roads and railroads, and defensive positions.

15. Photography clearly indicates that some of the SAWRFs in the densely populated east are being built by traditional methods. The Chinese are using a combination of mechanized construction equipment and local labor recruited from nearby villages. The SAWRFs located north of the test range, however, are being constructed with more capital-intensive methods than those in the east. This is to be expected, as there is almost no local labor to recruit in the Gobi Desert, and unskilled laborers are not brought in because the missile complex is considered a highly sensitive area.

*Why the Moats?*

16. In the flat terrain of the Gobi Desert and the North China plain, a moat provides a physical barrier between the SAWRF and an attacking force. In addition, Chinese defensive doctrine, as reported by defectors, calls for an adequate water supply for tunnel-type installations for drinking, sanitation, and fire-fighting. It is also common practice for troops to raise fish for their own food supply. Finally, and probably most important, in building any mound, revetment, or fill, the cheapest approach is to obtain the fill material from a nearby borrow pit. The moats fill each of these roles and in combination are the most economical and efficient method available.

*Why the "SAWRFLETs"?*

17. Although moats provide some physical protection, SAWRFs would make much stronger defensive positions if they were protected by additional fire power from a variety of weapons. This protection may be developing in the form of associated structures or "SAWRFLETs" that have been discovered around some of the SAWRFs. The so-called SAWRFLETs are probably nothing more than infantry strong points sited in support of the SAWRFs. In other words, they are pillboxes armed with automatic weapons, recoilless rifles, small-caliber field artillery pieces, mortars, and other weapons. Some of the structures also are probably used for storing ammunition and other military supplies.

18. Six pillboxes were recently identified along the coast of the Shan-tung Peninsula that are very similar in size, shape, and type of construction to some of the "SAWRFLETs" seen in the North China Plain and in the Gobi Desert. These structures were seen in 1965 photography, and they clearly were built to house coastal artillery pieces. Other groups of pillboxes and probable military storage sites have also been discovered along the northern portions of the trunk line runnning between Peking and Shanghai—near such cities as Tientsin, Ts'ang-hsien, and T'ang-ku.

*SAWRFs are an Integral Part of China's Overall Defensive Construction Program*

19. SAWRFs by themselves seem to be unique projects with some exotic purpose, but when they are viewed in terms of China's other construction programs they appear to be only part of a larger effort to build defensive facilities in depth. The current phase of this program started in the mid-1960s and is aimed at protecting strategic areas against conventional attack. The essence of the program is underground construction or "hardening."

*Airfields*

20. Chinese preoccupation with hardening military installations is most readily apparent in their airfield construction program of recent years. Since 1964 they have

newly built or improved almost 60 jet-capable airfields near the border and in the inland provinces. Ten of these airfields have extensive underground facilities for dispersing and servicing aircraft. Two hardened fields were started in 1964, four in 1966, two in 1967, and two in 1968. Nine of the ten fields are in the eastern part of the country in the same general area as the SAWRFs. The remaining underground airfield was recently started in north central China near industrial centers associated with China's advanced weapons program and about 400 air miles from Shuang-ch'eng-tzu.

21. When constructing underground dispersal areas to protect aircraft from attack, the Chinese usually follow the conventional approach of drilling tunnels into a nearby mountain side. At the new Ling-chiu airfield near Peking, however, they are using the same construction techniques they use when building SAWRFs. This approach was necessary because of terrain constraints—there are no mountains in the immediate vicinity of the field.

22. Subterranean facilities at the Ling-chiu field are being built at the edge of an alluvial plain near one end of the runway. The Chinese have excavated a trench in the silt and are pouring a series of massive concrete tunnels, similar to SAWRF tunnels but much larger. The width of the tunnels is between 60 and 70 feet and they will hold an estimated 30 to 40 MIG aircraft when work is completed. The tunnels will be mounded with earth during the final stages of construction.

*Naval Facilities*

23. The Chinese have also extended their hardening program to naval installations. The Ching-shan naval facility, located almost 20 miles northeast of Ch'ing-tao on the Shantung Peninsula, has been developed into China's first known underground naval facility. Ching-shan is possibly the home base for at least eight of China's OSA/Komar units in the North Sea Fleet, and the underground pen can apparently store and service all these boats. A 1,650-foot tunnel also links the main facility with a smaller barracks area on the south side of a small mountain headland. The base is the key facility for guarding the naval approaches to the strategic north China area.

*POL Storage Sites*

24. Another part of China's program of defense in depth is the nationwide system of hardened regional POL storage sites. At least 44 such sites have been identified in China since the later part of 1963. Most of the storage tanks are buried or semi-buried and are located in hilly country to take advantage of the protection afforded by the terrain. A few of the sites are in border and coastal areas, but the majority are located on the inland rail net. A military defector who helped build one of the sites reported that regional POL storage depots are run by the Chinese Army for the use of all three services.

*SAM Sites*

25. Judging by the known military construction program in the country, defense of the strategic northeast is clearly of prime importance to the Chinese. In addition to hardened airfields, naval facilities, and POL storage sites in the area, there is an apparent correlation between the location of SAWRFs and SAM sites. The only operational SAM sites around Peking are all located in the sector southeast of the city in an arc just beyond the two SAWRFs. A number of additional SAM sites were started near Peking during 1968 and will probably become operational in the near future.

*SAWRFs or "FADS" (Flat Area Defensive Strongpoints)*

26. The main points in this memorandum can be briefly summarized as follows:

a. SAWRFs are nothing more than mounded tunnels on flat terrain rather than drilled tunnels in hilly terrain. A terrain constraint, therefore, forced the Chinese to build hills where none exist.

b. Defensive gun positions are the only other installations we have ever seen having four or more entrances symmetrically placed and facing toward the sea coast or covering important LOCs. This applies to North Korea, North Vietnam, and China. Other types of underground installations are not built this way.

c. All of the SAWRFs are located astride natural invasion routes in the critical "A" and in the Gobi Desert.

d. All of the SAWRFs face along an azimuth which presents a logical field of fire toward an advancing ground force.

e. Pillboxes (SAWRFLETs) have been identified near the SAWRFs and, as would be expected, in areas where no SAWRFs exist.

f. SAWRFs are only part of a much larger construction program to provide defense in depth.

27. In essence, therefore, the Chinese have hardened their airfields, POL storage sites, and are deploying a SAM system as a defensive measure against *air attack*. They have constructed a network of coastal defense positions and have hardened at least one patrol boat pen to defend against *naval* bombardment and amphibious landing. The third phase in the defensive buildup would logically be to protect against an enemy *ground force* moving inland after breaching the coastal defense or a force coming overland from neighboring countries. This gap in the system is being filled by constructing a series of defensive positions composed of pillboxes and Flat Area Defensive Strongpoints (FADS). None of these measures is associated with offensive weapons systems or with strategic deployment of advanced weapons. The mounds would provide little defense against nuclear warheads delivered by missiles, but they are well tailored to defend against an attack by a hostile force using conventional weapons.

*A 24-hour command post:*

# THE CIA OPERATIONS CENTER

**Paul H. Corscadden and H. Lawrence Sandall**

This is the age of the 24-hour command post, a time when the intelligence community is forced to keep pace with advances in information processing; it must acquire automated data processing skills and adopt new methods to feed the thirst of policy makers for the "latest word."

The intelligence watch centers in the community are at the heart of a growth industry stimulated by the urgencies of crisis management, accordioning time zones, Orwellian engineering, and departmental rivalries.* As a group, they are loosely knit, not unified under central management, and held together by goodwill and shared information. The working arrangements among them, particularly when tension mounts, become of vital concern.

It would be untrue to say the Agency has blazed the path, but we can take credit for establishing the first 24-hour watch operation in the community. Twenty-six years ago the Office of Current Intelligence set up such a facility, manned by graduate students from Georgetown and George Washington.

*Command and Control*

The year 1961 is pivotal to an understanding of today's complex of centers and the interlocking relationship between defense and intelligence.

Soon after his inaugural, President Kennedy called for an exhaustive reappraisal of defense policy—ranging from the development of new weapons systems to organizational changes. On March 28, in a special message on the Defense Budget, he re-emphasized civilian authority over the Armed Forces, and he recommended new procedural arrangements that would reserve to him and other presidents and to key civilian advisers ultimate authority over military operations.** The White House and its staff thereafter operated on the premise that "Diplomacy and defense are no longer distinct alternatives, one to be used where the other fails . . . both must complement each other."

By late July, an impending crisis in Berlin led the President again to address the Congress on defense issues. This time he set forth the doctrine of flexible response and proposed the creation of quick reaction forces. These concepts breathed life into the

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*There are some 30 such watch centers listed by the Intelligence Community Staff. These do not include highly compartmented collection centers and numerous specialized activities housed within service or departmental organizations. The most important are:

CIA Operations Center,
National Military Command Center,
National Military Intelligence Center,
National Photographic Interpretation Center,
National SIGINT Operations Center,
State Department Operations Center, and
White House Situation Room.

**Because it also contained a $2 billion supplemental appropriation for additional ICBMs, Polaris submarines, and bombers, the message's central theme was largely overlooked at the time.

embryo of crisis management. The U.S.-Soviet confrontation over the Berlin Wall, beginning in August, brought home the inadequacy of communications links and the snail-like pace of interdepartmental consulation.

At least eight foreign crises occurred before the end of Kennedy's first year.* All lent leverage to an administration out to challenge the accepted way of doing business. When Soviet missiles arrived in Cuba, the entire military command and control apparatus was placed in the hands of the President—with significant faults.

Thus the stage was set to construct a World Wide Military Command and Control System (WWMCCS);** its focal point was to be a new National Military Command Center (NMCC), under the aegis of the Director of Operations for the Joint Staff (J-3) in the fall of 1963. The confrontation over Cuba hastened the advent of the NMCC by spurring the Joint Chiefs to wire together the major commands and autonomous services to ensure a quick response.

The inception and later expansion of the NMCC drove the USIB community to speed the flow of raw and the release of finished intelligence. The Cuban blockade saw the extension of White House control over ships at sea; the President and his civilian advisers communicated directly with the fleet, whose officers were no longer free to operate according to traditional guidelines for a quarantine. The Commander-in-Chief in Washington laid claim to enough on-the-spot information to steer a man-of-war. The inadequacy of military communications was evident.***

There began to emerge the notion of a field or fleet commander's role as a reporting source for national-level clients. The chain of command closed its own loop, with each echelon dependent on the other's intelligence and operational data.

A British anecdote may illustrate the implications accompanying the creation of the World Wide Military Command and Control System. One of His Majesty's skippers aboard the corvette *Flying Arrow*, off Hong Kong in 1949, was ordered only to "See to the best interests of the King," when Chinese Communist coastal artillery

*A selected crisis list during President Kennedy's first eight months in office includes the following:
February—USSR threatens intervention in the Congo.
March—Communist forces advance in Laos.
April—Bay of Pigs.
May—The Liberation Front and Hanoi announce victory possible in South Vietnam by year's end.
June—Khrushchev personally warns Kennedy in Vienna that Soviet peace treaty by December with East Berlin will end Western access rights in West Berlin.
August—Berlin Wall.
September—Soviets press for troika in UN following death of Dag Hammarskjold.

**The WWMCCS is designed to give the President all strategic and tactical *military* information rapidly and simply, and to permit him to order actions with minimum delay. It is simply the provision of technical resources in the command chain to the White House and Secretary of Defense, as well as the Joint Chiefs. In s strategic context, control of the nuclear trigger is central and unquestioned. What is disputed by civilian and military alike is the point in the use of conventional forces at which the exigencies of the tactical situation should override orders from Washington.

***This is a phenomenon in the American military experience. Its genesis lies in the creation of Unified and Specified Commands which can be tasked by the President and Defense Secretary without the knowledge of the Joint Chiefs. The first recorded use of it occurred on October 6, 1962, when the Deputy Secretary of Defense ordered CINCLANT orally to move a squadron of F4B Phantom jets from Norfolk to Key West as a precautionary move against Soviet MIGs in Cuba, bypassing JCS and the Chief of Naval Operations. The Navy squadron was to be under Air Force control once in Key West. During the blockade itself, the command chain ran from the White House to CINCLANT, descending to the task force and supporting elements. (See "Pentagon Civil-Military Tension Increases," *Aviation Week and Space Technology*, October 15, 1962, p. 26; and Captain F. C. Collins, USN, "The Loss of Leadership," *U.S. Naval Institute Proceedings*, April 1975, pp. 32-33.)

opened fire against merchant shipping. U.S. military officers are not likely to receive such latitude. Instead, Washington if it chooses can be a rudder command post, to use a naval expression.

The CIA agreed gingerly in January 1964 to man a 24-hour liaison billet at the NMCC. An invitation from the Director of Operations (J-3) had been proffered earlier and declined, but it soon became apparent that there was a fence between military operations and intelligence.

The harassment of commercial fishing vessels in the Caribbean by Castro Cubans the previous February was not always communicated to the DCI, whose exclusion from information passed via military channels went unnoticed—at first. But one such attack on a U.S. shrimp boat was reported by a U.S. Naval patrol to the Pentagon and then to the White House. It prompted an evening call from the President to a surprised John A. McCone. The DCI set out to correct the oversight.

*Strengthening Our Pentagon Acquaintance*

The men selected to serve with the NMCC came from the Directorate of Intelligence's Collection Guidance Staff (CGS). They were charged with levying requirements upon military collectors and monitoring U.S. contingency plans and operations.

The Panama crisis in 1964 revealed the NMCC to be a warehouse of tactical information on both friendly and enemy forces, and the "action officers" became conduits for channeling back to the Watch and the DCI military reporting on both anti-American demonstrations and U.S. responses.

They also relayed timely analytical material and Agency field reports to the military operators, so that our role in the NMCC thus took on another dimension. Moreover, our representatives exchanged information with colleagues from State Department, Defense Intelligence Agency and National Security Agency, and these exchanges became an informal national watch officers' conference.

Panama was not yet quiet before President Johnson ordered elements of the Sixth Fleet, with Marines, to stand by off Cyprus. Since most of the late President Kennedy's aides had remained at their posts, the new Chief Executive was able to capitalize on the strides toward civilian control of military forces taken by his predecessor. Cyprus was followed by the Tonkin Gulf incidents, the rescue of Americans from Stanleyville, and, in 1965, intervention in the Dominican Republic.

*The President's Watch*

A parallel but unheralded effort was under way in the White House to establish a channel to funnel intelligence of special interest directly to the Chief Executive and his staff advisers. Heretofore, cabinet members, senior departmental officials, and the DCI—all of whom shared responsibility for notifying the President and his immediate assistants of significant developments—had reported independently of one another. Such diffuse responsibility proved inadequate to the needs of an administration involved in the day-to-day direction of foreign policy.

The White House Situation Room was established in mid-May 1961. Located in the basement of the West Wing, it was staffed 24 hours daily by officers from CIA, State, and Defense. The White House soon became dissatisfied, however, and through a combination of performance and default CIA was asked to take over full staffing.

Those selected were chosen, as now, from the Agency's watch officers. They were referents for all intelligence centers, particularly after hours. The White House Situation Room now operates much as it did a decade ago, with two-man teams working under the direct supervision of a director (currently a former State Department officer) answerable to the Assistant for National Security Affairs.

There was only a slow awakening in the community to the implications this had for the intelligence process as the President forged closer to real-time command and control over military forces.

*"In the beginning . . ."*

Since John McCone,* the swearing-in of each Director of Central Intelligence has been followed by a letter from the President—a communication describing the emphasis and direction the inductee is expected to impart to the Agency and community. These letters have not been pro forma; indeed, they have contained key operating instructions that have served to enhance, not circumscribe, the DCI's authority. The more recent ones have outlined broad tasks relative to the intelligence process and its administration.

On January 16, 1962, President Kennedy wrote McCone that he was the . . . "Government's principal intelligence officer," . . . and should . . . "assure the proper coordination, correlation and evaluation of intelligence from all sources and its prompt dissemination to me and to other recipients as appropriate." The White House provided the cue in the phrase "prompt dissemination."

Three years later President Johnson appointed a new Director—Admiral Raborn. Although Raborn lacked intelligence experience, the President added another dimension to the responsibilities of the man in charge of the burgeoning and dislocated intelligence bureaucracy. He wrote Raborn on September 24, 1965: "Our government is making a substantial effort and is expending large sums of money to obtain timely intelligence vital to our national defense and security. This effort requires the most efficient possible organization of the activities of the various departments and agencies concerned. It is essential that these activities be conducted as an integrated endeavor best suited to meet both current and long-term national intelligence needs." With such charters, back-to-back, it was inevitable that "integrated endeavor" and "prompt dissemination" would fuse and a constant stream of raw intelligence be fed into and measured against both that which was known and that which was speculative.

McCone did his bit to streamline the flow of intelligence to the White House and pointed us toward the Pentagon. Raborn, with little heed for culturally grounded rivalries between Washington-based analysts and field collectors, ordered reconciliation within the Agency.

*All in One Place*

Santo Domingo prompted many changes. It coincided with the advent of a Director who had to cope with reports—exaggerated—of street gangs and wholesale terrorism. When the U.S. Ambassador reported rifle fire against his Embassy, the President asked the new Director just what-in-hell was going on, and the Admiral, who had spent most of his career pioneering the advent of nuclear missiles in submarines, found there wasn't one single referent he could turn to for the answers that Mr.

*At the risk of seeming to dismiss the Allen Dulles era, this account highlights the early 1960s when the intelligence/watch business changed in ways many of us failed to perceive.

Johnson—not the most patient of Chief Executives—wanted. The DCI nudged the Directorate of Plans into joining forces with OCI in the Watch, now dubbed the "Operations Center." This was an innovative decision, and not, as some of his critics have suggested, the result of a whim—something undertaken to concentrate everything at one phone number.

Berlin, Cuba, Cyprus, the Dominican intervention—all summoned the intelligence community to greater efforts in pursuit of more timely dissemination of unevaluated field reports and the production of "Situation Reports." But by the time U.S. forces went ashore in the Dominican Republic, the machinery for publishing finished intelligence failed to satisfy White House aides who believed from a distance that the analytical/production process was chaotic. One of them even visited CIA to observe how a situation report was put together and what retarded delivery to the President. If the U.S. commander on the scene could send in instant eye-witness accounts, why couldn't that reporting be digested and assessed in similar fashion? Neither electrical dissemination nor delivery by courier could overcome the hourly requirement for a blow-by-blow account of street fighting in Santo Domingo.

And what of the need to protect sources and methods, or the putative requirements of compartmentation, or "need-to-know" and all that? In practice, it is damaging as well as embarrassing for a CIA officer to inform the Duty General in the NMCC that the Agency has useful information, but that security inhibits its passage, or—worse still—that it will be "a while" before an incoming message is sanitized for release. Delay means an information gap, and can reduce command options.

The ability to orchestrate military responses in tandem with diplomatic initiative seemed indispensable to success. The separation of plans and operations within the intelligence cycle began to shrink. There was a perception that both were dependent on information; one geared to military decisions, and the other on relying on accurate recording of events and an assessment of their meaning. Technology would help bridge the remaining gap.

The Operations Center, still a proprietory of the Office of Current Intelligence's Watch, became a pestle for both McCone and Raborn. They left us a framework that could be expanded to accommodate the increased flow of information resulting from advances in technology, yet remaining flexible enough to allow for the integration of new resources.

*All-Agency*

In fact, little changed from 1965 to early 1973. But then two things triggered a re-examination of the Director's role vis-a-vis the President and the community, and the Agency's staffing in non-duty hours.

Military planners who had set out in 1972 to redefine national-level responsibility for strategic warning intelligence ended up by submitting plans for a national watch center under Pentagon auspices, a center staffed by watch officers/analysts drawn from various agencies. Their concern grew out of the strategic warning problem, but failed to distinguish the differences between strategic and tactical intelligence. The latter is heavily dependent on military collectors and provides a fairly rich, if incomplete picture, of weapon systems and combat forces. The other contains a large but frequently ambiguous dose of political and economic factors, i.e., the intentions and reactions of key national leaders to events, their perceptions of U.S. objectives, and their combat capability. Intelligence bearing on intent is not readily available; it is a

distillate of the best analytical judgments of the community. As the Government's senior intelligence adviser, the DCI not only manages strategic estimates, but conveys them to the President.

Concerned over the prospects that a national-level center under military auspices would support the so-called National Command Authority which does not include the Director, senior Agency officers set out to study the feasibility of a center answerable to the DCI, whose statutory responsibilities would thereby be reinforced. They concluded that was feasible, albeit difficult, given departmental rivalries, but the attention of the White House was riveted elsewhere. And so was that of the Agency's leadership.

A less innovative move followed—an accomplishment made possible by our own resources. Over several years, a number of DDI officers who had been involved in the Operations Center/Watch game, also had served abroad. There they could read the flow of field reports against the Washington-produced "finished intelligence," and had begun to wonder whether the Agency product advertised to White House and other consumers as the most timely and most authoritative was precisely that. Or did it suffer from a correctable time lag? If the latter were so, was the delay coincidental to communications lapses between the field and Headquarters and whatever befell a message on its receipt in Washington—especially after close of business—or to the coordination process?

At the recommendation of OCI's Director, Richard Lehman, who sought, too, to defend the DCI's prerogatives, the CIA Management Committee established an interdirectorate study group to explore what transpired after hours and examine the massaging of all narrative traffic addressed or readdressed to the Agency. Why was there a dual-directorate "Operations Center" on the seventh floor and another 24-hour facility on the fifth? How many such places were there? What did any do that was unique? To what degree were all living off the same paper? To whom did they answer? Who really had the authority to speak for the Director? To what extent could—and should—their separate functions be combined?

There were nine 24-hour facilities in Headquarters (three others were on standby); the majority lived off the same traffic; none was predominant or spoke clearly for the Director.*

More importantly, the study group found not all substantive traffic was being read against production requirements in non-duty hours. Instead, it was being scanned against reader profiles and with some delay by non-professionals and by people not privy to the publications.

The study group recommended that management create an all-source, Agency-wide Operations Center and affirm the authority of the Senior Duty Officer to speak

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*Intelligence Directorate
- CIA Operations Center
- Central Reference Service/Support Services Group
- Foreign Broadcast Information Service/Wire Services Staff
- National Photographic Interpretation Center

Operations Directorate
- Duty Officer
- Intelligence Watch

Science and Technology Directorate
- Foreign Missile and Space Analysis Center (FMSAC, now OWI)
- Office of Elint/Special Systems Operations Center

Support Directorate
- Office of Communications/Signal Center and Cable Secretariat

for the Director with the benefit of advice from duty officers from the DDS&T, the DDO, and the DDA. These and other recommendations were approved 6 June, with implementation set for 1 October.

A communications facility which had existed for some time on the seventh floor had to be wired directly into the Office of Communications so that incoming traffic would print out where it could be read by substantively qualified officers.

The DDS&T joined the Center on August 5, and the Office of Communications completed the task of pulling wire up to the seventh floor by the first of September. FMSAC and Ground Services Operations Center (GSOC) would follow in May 1975 as the Center, doubling its space, expanded downward to the sixth floor.

The Office of Communications had told us that we could expect a weekly cable flow of 15,000—a "take" likely to increase at the rate of 7 to 8 percent annually. This rate of increase has been observable in Agency communications over the past decade—hence the forecast seemed reasonable—but we are reading 46,000 items a week, including press: more than 270 items an hour!

The first week the Arabs and the Israelis squared off for the fourth time in October 1973, we read 83,000 items.

*Whom Do We Serve?*

The Operations Center has a broad mission in support of the Director and his principal deputies, and hence the Agency as a whole. It also has specific responsibilities in support of the Directorate of Intelligence and its production cycle.

We scan incoming narrative traffic in order to alert the Director and his principal deputies to information that may require action or prompt a query from the President, the Secretaries of State and Defense, etc. We select for reading by the Director and Deputy Director information that merits high-level attention—whether the most sensitive traffic or unclassified press ticker. Twice daily—at 0800 and at 1700—our duty officers prepare for the DCI, the DDCI, and the four Deputy Directors *The Director's Cable Summary*, the most exclusive intelligence publication in Government. It summarizes traffic which officers from three directorates judge to be critical, and appended to it are précis of spot reports sent to the White House over the same reporting period. Accompanying it is an *Operations Annex*.

Responsible for supporting the Agency's ongoing production, we are a service organization—not a production component. We seek to ensure that the White House Support Staff (responsible for *The President's Daily Brief*), the managing editors of the *National Intelligence Daily*, and the panel chairman for *The National Intelligence Bulletin* receive speedy delivery of the latest information.

We utilize the National Operations and Intelligence Watch Officers Net (NOIWON) to canvass the intelligence community to achieve a quick assessment, a community view of critical developments.

No electronic superstructure can compensate for human cooperation and diligence. As we adopt technology, we hope to avoid the soubriquet recently given to a Middle East country by the OCI analyst who wrote, "It is merely populous and not inherently strong." The production analyst is our client; once alerting has been accomplished, he must be free to do his job while we do ours.

What does supporting a task force mean? Well, it means assuring access to the existing communications system, providing clerical support for the production of an all-source situation report coordinated in-house for Washington consumers, and then converting the text for release to our Stations and U.S. embassies and, finally, liaison services. The evacuation of the Agency dependents from FBIS facilities on Cyprus, though planned and executed by FBIS management, was conducted alongside of a substantive task force.

An analytical task force is altogether different from an operational one. The intelligence analyst is asked to produce situation reports and briefings or special estimates for the National Security Council or Washington Special Action Group. These are best done by a small group of people—lest a great milling about lead to confusion and mishandled information.

The best managers strive for an elusive but effective balance between personnel and workload. The CIA Operations Center probably is the only 24-hour component in Washington whose workload has had quantum jumps in the past 15 years, with only a negligible increase in manpower. Complements from the Directorate of Operations and that of Science and Technology have been added, but in the Center's "bullpen," where the "eyeballing" of most traffic is done, the division of labor is relatively unchanged. This continuity stems from a conscious managerial effort to nurture the growth and exposure of young recruits.

The insight distilled from experience and error is embodied in seasoned officers who are ready for the next crunch. Their familiarity with the habits and analytical environment of senior Agency officials and area experts is as important as their almost intuitive recognition that an incoming message merits closer scrutiny. Their professionalism contributes immeasurably to keeping the lid on or blowing the whistle for our sleeping colleagues.

The creation of today's all-source alert center is a singular achievement. Its accomplishment goes far in the direction of aiding a near real-time publication schedule. One need only witness the teamwork at 5:00 AM to accommodate a major headline change for an intelligence newspaper delivered at 6:30 AM. The Agency's compartmentation into Directorates and Offices is shattered by the effective communication among analysts, editors, duty officers, clericals, and printers—all of it unceremonious and void of both rank and protocol.

Those graduate students 26 years ago gave us an equity early on in the quality of the intelligence product. Today, it gives meaning to our association with all current producers.

The juncture that occurred in 1973 altered our role as the night broker for current intelligence. May the next Study Group do as well in helping us meet our obligation to all analysts on whatever disciplinary pedestals they stand.

# INTELLIGENCE IN RECENT PUBLIC LITERATURE

THE ULTRA SECRET by *F.W. Winterbotham, CBE.* (Harper & Row, New York, 1974)

We now have available a book purporting to reveal facts about British communications intelligence successes in World War II. Some passing references are made to U.S. work in this field. If such a revelation about Allied cryptanalytic successes in WW II was inevitable, it can be debated whether a professional COMINT officer would want it made by a person who knew absolutely nothing of any technical aspects of the subject (certainly true of RAF Group Captain F. W. Winterbotham) or by one possessing at least the most elementary technical knowledge. In the first instance, a Winterbotham can reveal the fact of analytic operations against the German ENIGMA while hopelessly confusing the extent of the success and the fact that other types of machines and hand systems were also involved. A person with any technical background could never have made the word ULTRA synonymous with ENIGMA decrypts. ULTRA simply was an UK/US agreed word to designate decrypts resulting from cryptanalytic work against any targeted high-level system.

Once reconciled to the inevitability of publication, a cryptanalyst can single out a number of interesting aspects of *The Ultra Secret.* It increases, for instance, the depth of meaning of Churchill's famous statement "Never was so much owed by so many to so few." There actually were two "fews" involved, one of them the RAF fighter pilots and the other the "cryppies" at Bletchley Park, the site of most of the British wartime cryptanalysis. But let us not unduly distort our perspective because of the book. Cryptanalysis did not win the war either in Great Britian, in the Atlantic, in Europe, or in the Pacific. It was a weapon, one of utmost value, but still a weapon to be used either skillfully or clumsily. Both usages occurred, and many are highlighted. In the glow of cryptanalytic successes, the reader may overlook the need for the blood and the sweat and the tears of the fighting men. There was extended hard and very bloody fighting in all theatres, without whose success there would be no Free World as we know it. The fearlessness and self-sacrifice of the skilled and all-too-few RAF fighter pilots gave Britain a chance to survive. True, they were often positioned in advance and the number of them actually committed to any engagement was carefully scheduled and controlled by knowledge derived from ENIGMA (when available) and other decrypts. We should also note that the actual engagement and the fighting, once a German raid was launched, were heavily influenced by British radar which was vital both to give the precise last-minute timing and location of the raid and to provide plausible cover for the effective fighter attacks. This cover was good enough to fool the Germans and most of the English, for only a very few most senior English commanders knew of the existence of the decrypts.

Full credit must be given to Group Captain Winterbotham for the establishment and maintenance of what today we would call an SSO (Special Security Officer) system. He worked hard at it, and it was effective. I am not so sure that the comparable United States SSO system, particularly in the Pacific, was as much dependent on his energy and travel as he would have the reader believe. But he does make crystal clear the successful and necessarily extreme measures that were used to

control the handling of ULTRA and, where possible, to sanitize it so that it could be used in a timely manner. He leaves no doubt that some of the brilliant tactical victories achieved by maneuver and accurate estimation of enemy intentions were made possible by looking into the ULTRA mirror which revealed key cards in enemy hands. This information may, no doubt, reduce the stature of some battlefield commanders. Some were unable to grasp the meaning of the material made available to them or unwilling to use it promptly for some reason or other. No need for me to name names in this review, for Winterbotham's book is based not on official history but on his recollections, which are at best incomplete even if quite accurate in places.

*The Ultra Secret* is a prolific source of misinformation. It is absurd or wryly laughable to read that the cryptanalytic coups against the Japanese navy, e.g., the Battle of Midway, were made possible because ENIGMA machines were used by that navy. None were used for any Japanese navy traffic at any time in any area. It is equally erroneous to imply that any Japanese diplomatic communications were ever enciphered by a derivative from any version of the ENIGMA. The "purple" (diplomatic) and the "red" (naval attaché) machines were related to one another, but in no way to any German equipments.

No one of dozens I knew from Bletchley Park, either in the British party or in the sizeable American contingent, had ever heard of the "bronze goddess" or the "Eastern Goddess" or the "oracle of Bletchley" until they read this book. Winterbotham speaks of *one* decryption device, whereas in fact there were almost two hundred British devices by 1944, and more than one hundred equipments in the U.S. of a more complicated nature to deal with more sophisticated versions of the ENIGMA. All were called "BOMBES" after the Polish name for their analytic equipment, "bomba," since the Poles first achieved a cryptanalytic solution in the late 30's of one of the original (and simpler) versions of the ENIGMA. The "BOMBES" were used to set messages and not to decrypt them. Decryption was done either on replicas of the German equipments or on higher-speed cryptographic equivalents manufactured by the United Kingdom or the United States. No "goddess" or "oracle" did any speaking.

Seriously misleading inferences can be drawn from the book, e.g., that almost all German traffic was read and that all levels of traffic, including the highest level of command, were enciphered by using ENIGMA machines. In actuality a very skilled management of available COMINT resources was mandatory, for there always was more traffic to be set and decrypted than available cryptanalysts and equipment could manage. Selectivity of material and direction of effort were skillfully accomplished, as the results show. There also were several other kinds of German machines in use; the several different versions of the ENIGMA were devoted almost exclusively to operational traffic. A message from Hitler enciphered by ENIGMA is so rare as to be almost if not actually non-existent. I have heard of none such. Highest-level German Command traffic, including messages from Hitler, was enciphered in other machines apparently unknown to Winterbotham. An occasional German commander would insist that his orders not be transmitted on the air, possibly (or probably) more because he mistrusted the setup which made cryptographic and code room personnel knowledgeable of his plans than because of any doubts about the security of the cryptography.

Another major aspect of the problem, apparently quite unknown to Winterbotham, was the difficulty of actually understanding and making operational sense out of the decrypts. This statement might be clearer if the reader were to imagine that he began to have somewhat random access to streams of technically-oriented

telegrams and not to all of them in any one stream. It would take some time and intensive study and imagination to develop the background and the specialized vocabulary necessary to understand the telegraphese, the abbreviations, the specialized allusions, the references to past events and statements, etc. A very major effort had to be put into this work, and brilliant results followed. But the work involved, the competence of the intelligence analysts engaged in this area, and the many frustrations and false leads that were not allowed to hamper the flow of useful material are not even alluded to in the book.

The sizeable American contingent working side by side and around the clock with their British colleagues at Bletchley Park has been overlooked. Maybe Winterbotham never actually crossed the threshold into the working area? There is almost no mention of the German Naval ENIGMA, a more complicated equipment than the Army version, whose solution was so important in winning the battle of the Atlantic. Nowhere in Winterbotham's book is there any clear indication of the effective wartime liaison and exchange of technical personnel and data between the British and the U.S. Army and Navy COMINT organizations.

Judged from the viewpoint of today's cryptanalysts, it is most helpful that *The Ultra Secret* is the bad and incomplete book it is. His account is inaccurate in detail, and although it resembles the truth in outline, much of it is purely imaginary. Nonetheless, one seriously damaging effect the book will have is to give target communications security organizations an accurate base line from which to estimate the competence of the US/UK SIGINT organizations. The successful cryptanalysis of the ENIGMA in the 1940's as set forth in the book gives an accurate measure of competence not hitherto available in unclassified literature. Extrapolation from that information in light of the power of modern, very powerful computers may well cause several lucrative targets to have second thoughts about their present systems and to take remedial measures. I do not believe the book should have been published, nor do I think it would have been if Group Captain Winterbotham had not hoped to usurp a prominent place in the spotlight he is using to illuminate an area that practicing COMINT personnel would prefer to have in the shadow. Without competent code clerks and communicators, the successes he details could not have occurred; his valid claim to fame is scarcely greater than theirs. In addition to alerting target Communications Security organizations to the UK/US cryptanalytic capability against a device of the complexity of the ENIGMA, *The Ultra Secret* will probably have the effect of causing someone (not me) to attempt a book in which Winterbotham's many errors are corrected and the American role adequately portrayed. Further revelations can only make steeper and rockier the road today's cryptanalysts are walking.

Louis W. Tordella

THE FROLIK DEFECTION, by *Josef Frolik*. (Leo Cooper, Ltd., London, 1975.)

Josef Frolik, now 47 years old, was a major in the Foreign Intelligence Directorate of the Czechoslovak Ministry of Interior who defected to the West in July 1969, accompanied by his wife and teenage son. While he had apparently contemplated defection for some years, his final decision was prompted by the Soviet invasion of Czechoslovakia in August 1968. As a supporter of the short-lived reformist regime of Alexander Dubcek, Frolik faced at least the loss of his position and, as he puts it, probably worse.

Having been recruited for the Czechoslovak Intelligence Service (CIS) in 1952 as a "promising young Party member of unimpeachable proletarian background," Frolik quickly rose through the ranks and served during the ensuing seventeen years both at the Prague headquarters and abroad, including a tour in London. The psychological shock and a feeling of deep national shame following the massive Soviet military intervention against a small friendly neighbor caused several other CIS officers to leave the service and the country. Of these one, a specialist in deception and disinformation operations, has already written a book,* and another is planning to publish his in the near future. In addition to already known information, the wealth of material provided by these defectors serves as confirmation of much of Frolik's account, since several of these CIS officers were either involved in or at least knew about some of the case histories described. Furthermore, Frolik—a thorough professional—prepared himself well for the crucial step which would affect the rest of his life. Because some of his colleagues had defected in 1968, the CIS was forced to undertake a massive defensive reorganization which had been completed by the time of Frolik's own departure in 1969. Consequently, by studying these changes and making copious notes which he was able to take with him, Frolik was in a position to report in detail not only on hundreds of his colleagues and their agents but quite fully on the CIS's "new look."

Despite voluminous cuts by British officials censors and Frolik's self-censorship prompted by British libel laws (an uncensored U.S. edition is planned), *The Frolik Defection* is still well worth reading. It is presented in a concise and convincing manner and offers a number of fascinating case histories, many of which have been confirmed by independent sources. It goes without saying, as already noted in some British press reviews, that those people who regard the KGB and the East European Intelligence Services as mere inventions of cold war propaganda, will certainly cast doubt on Frolik's exploits, especially those dealing with the subversion and, in some cases, recruitment of prominent Western personalities. The credibility of Frolik's account however should be enhanced—at least to the initiated reader—by the well-documented fact that the CIS, more than any other East European intelligence service, has for 20 years been used by the KGB (and is still) to conduct operations around the globe which do not even remotely represent Czechoslovakia's national interest. The CIS, ostensibly operating on behalf of a small nation with few political and economic concerns beyond continental Europe, has with Soviet prodding shown a

*Ladislav Bittman: *The Deception Game* (Syracuse University Research Corporation, 1972), reviewed in *Studies in Intelligence XVII/1*.

surprising appetite and capability for conducting intelligence operations on every continent. While the other East European services also cooperate with the KGB, it was the CIS which was usually singled out to operate in those areas where a high Soviet profile might have been suspect. These included large-scale anti-U.S. operations in Africa, Asia, and Latin America, such as fomenting "peace" demonstrations, organizing student riots, and spreading forgeries. In Western Europe, where the CIS can claim at least some logical reason for operating, its targets are not only people with access to military, political, and economic information, but also high-ranking individuals with political influence in their respective countries, such as members of parliament, trade union leaders, and political party officials. Frolik identified, but in the book did not name, three British MPs as having been recruited by the CIS, and provided damaging information on others (such as the recently publicized Stonehouse case). On the basis of Frolik's testimony, one MP was indicted and tried, but he was eventually acquitted "for lack of convincing evidence."

Of the individual topics and case histories described by Frolik in his book, his London experience is probably the most interesting, despite the fact that it is in this chapter that the British censors have been busiest. Also, it is this phase of Frolik's experience which is and will continue to be most loudly criticized by both friend and foe precisely because it exposes CIS methods and the unfortunate gullibility of certain highly placed Western personalities to various types of CIS approaches. The chapters on CIS operations against emigrés, notably Josef Josten and his Free Czechoslovak Information Service in London, are well presented and correspond with the wealth of available information on the traditional Soviet and Eastern European paranoia about their national emigration. Information on the unimplemented CIS plan to assassinate or kidnap Josten has been reported by other sources. The chapter entitled "The Czech Philby," dealing with a CIS penetration of British Intelligence operations against Czechoslovakia, seems to be overstated when one compares it with known facts on the subject. By 1958, when the penetration agent was reportedly recruited by the CIS, British offensive operations against Czechoslovakia were virtually phased out; it is, therefore, doubtful that the "Czech Philby" could have caused as much damage as claimed by Frolik.

On the internal CIS side, the book provides intimate details of its objectives, procedures, and methods, as well as closely drawn portraits of individual officers, and past and recent high-ranking Interior Ministry personalities. The period which must have been the most painful for Frolik to deal with, namely, the Soviet invasion and its aftermath, is treated with commendable objectivity in describing the profound effect these events had on the CIS and its individual officers, both liberals and pro-Soviet hardliners. Finally, it should be noted here that Frolik's dramatic escape story is not entirely factual; he did not have contact with CIA in Prague, but rather walked in at a U.S. Embassy in another country.

The one weakness of Frolik's story is of a purely subjective nature, and a familiar one with most defectors from Communist countries. One has a nagging feeling that Frolik is trying very hard to convince himself that he had intellectually parted with the objectives and methods of the CIS as early as the late fifties, and that it was only due to circumstances beyond his control that he remained in place as long as he did. Straight admissions by some of the other CIS defectors that "they had never dreamed of defecting" until after and because of the Soviet invasion, sound significantly more credible. This is not to say however that Frolik is consciously deceiving himself or his readers. This comment is merely a reflection of dealings with many individuals who

had to face the same problem, namely, the question of conscience which all former Communist intelligence officers upon their defection had to grapple with.

In summary, *The Frolik Defection* is an eminently readable and believable account of the inner workings of the most important East European intelligence service, which should be of interest to both the professional and uninitiated readers, except of course those in whose estimate the KGB & Company can do no wrong.

FIGHT ANOTHER DAY. *By Lt. Col. J.M. Langley.* (Collins, London, 1974.)

SATURDAY AT MI-9. *By Airey Neave.* (Hodder & Stoughton, London, 1969.)

Here are two books of wartime memoirs, published only in England, about a rather esoteric branch of British Intelligence known as MI-9. Both will have found an interested but rather limited audience. In the best British tradition, neither book "tells all." Indeed, both are so discreet regarding anything approaching tradecraft secrets that they will be of only marginal and historical interest to the professional intelligence officer seeking information on "how to" or "how not to."

Langley's book is by far the better. It is livelier and provides a clearer organizational picture of how certain special wartime British secret offices came into being and where they fitted into the overall intelligence structure.

What is (or was) MI-9 and what did it have to do with American intelligence in the second World War? MI-9 got its start in the early days of the war when the British decided an organization was urgently needed to help its soldiers (mostly downed airmen) evade capture in German-occupied Europe or, if captured, to escape. Very quickly MI-9 created and was managing networks of French, Belgian, and Dutch men and women who dedicated themselves at enormous personal risk to getting British, and later American, evaders and escapers back into allied hands "to fight another day."

Some of Langley's book (and much of Neave's) is devoted to detailed descriptions of these escape and evasion networks in France and the Lowlands. These accounts, a number quite dramatic, include the story of the exploits of Pat O'Leary, who became one of the legends of "E & E." Royal Navy Lieutenant-Commander Patrick O'Leary was in fact a doctor in the Belgian Army named Albert Guérisse, who had escaped to England in 1940, volunteered for service in enemy waters off the coast of Southern France and—because he got left behind one night in the confusion of a landing operation—ended up in France running an important E&E network for two years until his capture through treachery in 1943.

Langley draws a rather sympathetic picture of the MI-9 Chief, Brigadier Norman Crockett, whose full title was Deputy Director of Military Intelligence for Prisoners of War, shortened to DDMI P/W. Crockett had many virtues, not the least that he lacked the latent and sometimes active anti-Americanism of Langley (and of author Airey Neave). Most American officers who served with them, including this one, found the egos of Langley and Neave to be rather vast and discovered that the feeling was shared by a number of their British colleagues.

It so happens that Crockett also directed as part of his responsibility another interesting branch known as MI-19, which was concerned with the detailed interrogation of those relatively few enemy prisoners who had special, even vital, strategic information—a German general captured at Tobruk, a submarine captain rescued from the North Atlantic, a signals sergeant captured in North Africa. (None of these details, unfortunately, is included in Langley's book, which deals exclusively with MI-9.) The most interesting facet of *Fight Another Day* is Langley's anecdotal account of himself: how he became a Coldstream Guardsman; the dramatic role he and his comrades played before their capture at Dunkerque; how he managed, though

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still not recovered from the loss of an arm, to escape and return to England; and how as a result he got into the escape and evasion business.

Although the reader will learn that MI-9 was part of MI-6, Britain's Secret Intelligence service, he will get no new insights into how MI-6, or for that matter MI-9, handled its technical tradecraft problems. Radio messages, yes; how to construct and protect codes, no. He will learn that the brave men and women who were recruited for the networks were mostly motivated by hatred of the Germans or by a conviction that human freedom depended on the Allies winning the war. The reader will learn that some endured terrible tortures and that some, often the bravest, died. What he will not learn is methods which might be useful for the future. He will not learn, for example, how the British communicated clandestinely with prisoners in the enemy's camps.

Just before D-Day, a special "European Campaign" off-shoot of MI-9 was established to operate with the Allied armies on the continent. The unit was a joint British-American operation and bore the name I.S.-9 (WEA), short for Intelligence School—9, Western European Area. The British personnel came from MI-9, while the American members—both officers and enlisted men—were from MIS-X (Military Intelligence Service—X), the U.S. Army's escape and evasion component and the equivalent of MI-9. Small detachments of I.S.-9 (WEA) were assigned to each Allied field army to organize and bring about rescues if that should prove practicable. (To a large extent it did not, because the Allied forces rolled over France too rapidly, but there were later some successes in Holland). The British-American detachments did, however, interrogate escapers and evaders in the field, not only to extract intelligence quickly about what was "beyond," but also to establish these men's bona fides.

*Saturday at MI-9** might very well lead the reader to believe that the Americans hardly had a role in the common cause of escape and evasion. The British did in fact have the lion's share of "E & E" responsibility in the European Theatre, just as the Americans had it in the Pacific. This state of affairs existed by mutual U.S. & British agreement, however, which is a point Neave chooses to ignore although he could hardly have been unaware of the agreement. Perhaps this was a calculated omission, explainable by an observation of Langley (page 73) about his colleague, "Airey will, I am sure, forgive me when I state that he had already mastered the art of calculated arrogance."

Let it not be said that Neave is unclever. He managed in 1953 to get elected to a seat in Parliament and to retain that seat over the years, and was recently credited by *The Economist* with being the architect of Margaret Thatcher's victory over Edward Heath for the leadership of the Tory Party. A British friend from the days of MI-9 recently remarked to this reviewer, "Airey never lacked the knack of attaching his wagon to the right star."

The serious reader will not learn any more about "how to do it" from Neave than from Langley. Let it be said, even so, that the book contains interesting historical and statistical information. The following is an example of the kind of facts which find ample place in the Neave book and which, in print, are a valuable contribution to the history of these little known episodes of World War II: "The actual MI-9 figures for Air Force evaders in Western Europe as a whole were: 1,975 R.A.F. and Commonwealth, and 2,962 United States Air Force." (p. 221)

*"Saturday" was Neave's pseudonym.